















## THE EDICT OF WILLIAM THE TESTY



William the Testy, second governor of New Amsterdam, issued an edict prohibiting smoking, which provoked warm indignation, and an army of insurgents, well supplied with pipes, tobacco and determination, seated themselves before the governor's house and began to smoke. Governor Kieft came forth in a fury and asked what they meant by this "outrageous fumigation." They did not reply, but puffed and puffed in stolid silence. It is related that the governor came to terms.

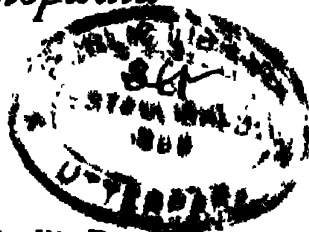
# The Book of Knowledge

## *The Children's Encyclopædia*

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VOLUMES XXIII AND XXIV

*London:* THE EDUCATIONAL BOOK CO.

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## The Story of FAMOUS BOOKS

### A STORY OF EGYPT AND PERSIA

**T**HIS story of Egypt when its power was declining, was written by Georg Ebers, a German professor of Egyptology. He made several expeditions to Egypt to study the remains of the past civilization, and made some important discoveries. One of them was the book which tells us most that we know about the medical knowledge of the Egyptians. Though he wrote several learned books, he took more pleasure in his stories. This is his first and most popular, but he wrote a half dozen others, describing Egyptian life in the long ago. This book was published in 1864, and was soon translated into several languages, and has been read in many lands. It is still popular.

## AN EGYPTIAN PRINCESS

**A**BOUT six hundred years before the birth of Christ, the Greeks at last gained a port at the mouth of the Nile. The Egyptians hated strangers, and clung to the ways and religion of their forefathers; and they feared lest the coming of foreign nations among them should cause great changes in their customs. Nevertheless, the Greeks by their hardiness and clever trading succeeded in pushing their way even into this closed land, and were given the town of Naukratis by King Amasis, where they might live and trade and build temples to their gods.

King Amasis felt the attraction of this wonderful people. His wife, Ladice, was a Greek, and the captain of his mercenaries, Phanes by name, was an Athenian. But the Egyptian priests hated the foreigners, for they knew that if Greek learning ever became popular in the land of the Nile, their own great influence would be at an end. So they were ever on the watch to discover some offence against the law or ancient customs of the country. It happened that Phanes, the handsome and witty captain of the foreign legions, showed contempt for the sacred animals of the Egyptians by having some kittens drowned. He was sentenced to death, and with difficulty could King Amasis succeed in changing the sentence to banishment. Not only had Phanes offended all the priests, but he had also incurred the

hatred of Psamtik, the king's son, who swore that the Greek should not escape his vengeance.

On his way into exile the ex-captain stopped near Naukratis with Rhodopis, a very beautiful woman, whose house was the centre of the Greek colony in Egypt. Here he met many of his countrymen, learned the news from Greece, and obtained a promise from the mistress of the house that she would shelter his little boy and girl from the enmity of the prince while they were awaiting a ship to follow him to Thrace. Rhodopis was glad to do this for the courageous exile, and her granddaughter Sappho, a beautiful young girl who lived with her, welcomed the prospect of play-mates.

At this time there came to the court of Egypt an embassy from King Cambyses of Persia, seeking the hand of the king's daughter, Tachot, in marriage. Cambyses did not come to Egypt in person but sent his brother Bartja, a handsome young prince of twenty years, with an old king, Croesus of Lydia, with him as adviser and guide. Amasis entertained the Persians with great splendor and rejoicings, and even offered to send, instead of Tachot, Nitetis, his fairest daughter, for Egypt stood in need of peace. At a great feast to celebrate the betrothal, Bartja, the young Persian prince, and Nitetis, the Pharaoh's daughter, were conspicuous for their superior beauty,

grace and charm. The royal maiden wore a transparent rose-colored robe, in her black hair were fresh roses; she walked by the side of her sister, the two robed alike, but Nitetis pale as the lotus flower in her mother's hair.

"Be of good courage," said her mother, "and meet thy fortune bravely. Here is the noble Bartja, the brother of thy future husband."

Nitetis raised her dark, thoughtful eyes and fixed them long and inquiringly on the beautiful youth. He bowed low before the blushing maiden, kissed her garment and said:

"I salute thee, as my future queen and sister! I can believe that thy heart is sore at parting from thy home, thy parents, brethren and sisters; but be of good courage; thy husband is a great hero, and a powerful king; our mother is the noblest of women, and among the Persians the beauty and virtue of woman is as much revered as the life-giving light of the sun. Of thee, thou sister of the lily, Nitetis, whom, by her side, I might venture to call the rose, I beg forgiveness, for robbing thee of thy dearest friend."

As he said these words he looked eagerly into Tachot's beautiful blue eyes; she bent low, pressing her hand upon her heart, and after he had gone let her thoughts dwell lovingly upon the gallant prince.

One of the pleasures that the Persians enjoyed in their stay in the strange country was a visit to Rhodopis, near Naukratis. At her house they met and all talked with the exiled Phanes, who was waiting for a ship to bear him into Thrace, for he dared not outstay his time, knowing that Psamtik's jealous anger was seeking to do him harm. One night when some of the Greeks and older Persians were supping together, the younger strangers surprised an ambush that had been laid around the house to entrap Phanes, but by disguising himself the latter escaped from the land. He bore with him a secret very dangerous to the reigning house of Egypt, namely, that Nitetis in reality was no daughter of King Amasis, but the only child and heiress of King Hophra, whom Amasis had deposed. By fraud, therefore, Amasis was trying to make an alliance with Persia, and it was certain that the wrath of Cambyses, if the trick should be discovered, would be terrible indeed.

At the house of Rhodopis, also, Bartja saw the charming Sappho, and fell deeply in love with her. The change which the power of love made in his character, passed unnoticed by all but Tachot, the daughter of Amasis. From the first day on which they had spoken together she had loved him, and her quick feelings told her at once that something had happened to estrange him. In her distress she confided her sorrow to Nitetis, who bade her take courage, and the two built many a castle in the air, picturing to themselves the happiness of being always together at one court and married to two royal brothers. Nevertheless, Bartja's love for Sappho increased, and before leaving for Babylon, he obtained a promise from her grandmother that the girl should be his bride when he returned from Persia.

Three days later, a densely packed crowd surged round the landing-place. They had assembled to bid a last farewell to their king's daughter, and when at last the wind filled the sails of the royal boat and bore the princess, destined to be the great king's bride, from their sight, few eyes among that vast crowd remained dry.

Seven weeks after Nitetis had quitted her native country, a long train of equipages and horsemen was to be seen on the king's highway from the west to Babylon, moving steadily towards that gigantic city, whose towers might already be descried in the far distance. The highroad followed the course of the Euphrates, passing through luxuriant fields of wheat, barley and sesame. Slender date-palms covered with golden fruit were scattered in every direction over the fields, and although it was winter, the sun shone warm and bright from a cloudless sky.

At the last resting place on the journey, Nitetis descended and put on Persian dress, to appear well-pleasing in the eyes of Cambyses. The splendid silken garments of a Median princess, flashing with gold and jewels, set off her dark beauty and she seemed already clothed in the majesty of a queen, when a troop of two hundred horsemen on white horses appeared in full gallop before her. Their leader rode a powerful coal-black charger, and wore a vesture of scarlet and white, thickly embroidered with eagles and falcons in silver. The lower part of his dress was purple, and his boots of yellow

leather. He wore a golden girdle and in this hung a short dagger-like sword, the hilt and scabbard of which were thickly studded with jewels.

His hair and beard were black as ebony, and his features pale and immovable, but his eyes glowed with a fire that was scorching. Across his high forehead, arched nose and thin upper lip ran a deep, fiery-red scar, given by the sword of a wild enemy. His whole demeanor expressed power and unbounded pride. Bringing his unruly steed to a stand by the side of Nitetis' carriage, he gazed upon her, and waving his hand in token of welcome, rode to her escort, who had alighted from their horses and were awaiting him. He commanded Croesus, the aged king of Lydia, to ride with him at the side of the carriage as an interpreter between himself and Nitetis.

"She is beautiful and pleases me well," began the king. "Interpret faithfully all her answers, for I understand only the Persian, Assyrian and Indian tongues."

Nitetis caught and understood these words. A feeling of intense joy stole into her heart, and before Croesus could answer, she began softly in broken Persian, and blushing deeply:

"Blessed be the gods, who have caused me to find favor in thine eyes. I am not ignorant of the speech of my lord, for the noble Croesus has instructed me in the Persian language during our long journey. Forgive if my sentences be broken and imperfect; the time was short and my capacity only that of a poor and simple maiden."

Pleased at this sign of industry, for he was accustomed to see women grow up in idleness and ignorance, Cambyses greeted her kindly, and gave her for her dwelling a pleasant palace in the hanging gardens. There she could live apart from his other wives and under no rule save his own, and when she became familiar with the customs of Persia and the religion of his gods the law of the land would allow him to marry her.

And so began a quiet but happy life for Nitetis in her country home. Her only companions were Kassandane, the blind queen-mother, and Atossa, Cambyses' young sister. Every day she received instructions from Croesus, who talked to her about Egypt and her loved

ones, but always in Persian, and every second day the high priest was in attendance to teach her the Persian religion. She saw Cambyses only rarely, but he presented her continually with rich dresses and costly jewels, and her former fears of him changed into love and admiration.

The king had many other wives, but he no longer cared for them after he had seen Nitetis. For this they blamed the Egyptian princess, and would have rejoiced if evil had come to her. Boges, also, chief of the eunuchs, and keeper of the women, lost power because he had no rule over Nitetis, and he began a plot to ruin the blameless girl.

Now Bartja, the younger son of Cyrus the Great, was more beloved by the people than Cambyses the tyrant, and for this reason, his brother was sometimes jealous of him, and sent him to subdue a wild tribe upon the frontier after his return from Egypt, because he suspected that Nitetis loved him. Cambyses at last grew certain that he was loved by Nitetis, and when Bartja returned victorious from his war, greeted him warmly and bade him ask upon his birthday for any favor that he would have. The king's birthday was celebrated with great pomp throughout the land; sacrifices to the gods were offered early in the morning upon the banks of the Euphrates, and at noon Cambyses began a great feast to which the envoys from the conquered provinces were bidden.

The great throne-room presented a vision of dazzling and magic beauty. In the background, raised on six steps, each of which was guarded by two golden dogs, stood the throne of gold; above it, supported by four golden pillars studded with precious stones, was a purple canopy. The walls and ceiling of the entire hall were covered with plates of burnished gold, and the floor with purple carpets. Before the silver gates lay winged bulls, and the king's body-guard, their swords in golden scabbards and their lances ornamented with gold and silver apples, were stationed in the court of the palace.

That day, Nitetis for the first time took part in the general sacrifice made by the king's wives, and tried to pray to the new gods in the open air before the fire-altars and amid the sound of religious songs strange to her ears. The

gaze of the women around her, and the loud music, disturbed her, and her thoughts strayed back to the solemn stillness of the gigantic temples in her native land, where she had worshipped the gods of her childhood so earnestly at the side of her mother and sister. And then, too, she longed to get back to her room to read her first letter from Egypt, which had arrived that day.

At last the long ceremony was over, and Nitetis, ordering her litter, was carried back to her dwelling and hastened to the table where lay the scroll. Breaking the seal, she began to read in a happy mood, but her face soon grew serious and when she had finished the letter fell to the ground. Her eyes were dimmed with tears and her head, carried so proudly at a few minutes before, now lay in the jewels which covered the table. Amasis had been stricken with blindness, and Tachot—her loved Tachot—lay sick of a wasting fever which none could cure, for no one knew the cause thereof! Nitetis sat in her royal purple, weeping, forgetful of everything but her mother's grief, her father's misfortune and her sister's illness. Unnoticed, outside one of the windows, Boges, chief of the eunuchs, stood peering in and taking count that Cambyes' chosen bride was weeping on her lover's birthday.

At the royal banquet that night, Nitetis sat by the king in all the splendor and dignity of a queen, but looking very, very pale in her new purple robes; she was thinking of her young sister, Tachot, dying for love of Bartja. Cambyes had never felt so happy as on this day and his usual severity seemed to have changed into good-nature, as he turned to his brother Bartja with the words:

"Come, brother, have you forgotten my promise? Don't you know that to-day you are sure of gaining the dearest wish of your heart from me? Drain the goblet and take courage! But do not ask anything small, for I am in the mood to give largely to-day."

Bartja, whose cheeks were glowing from agitation, bent his head close to his brother's ear and whispered shortly the story of his love for Sappho. At the close of the whispered tale Cambyes embraced him kindly, and looking at the Egyptian, exclaimed:

"In a few days our brother Bartja will leave us for your country, Nitetis, and

will bring back another jewel from the shores of the Nile to our mountain home." And Nitetis, who knew nothing of his love for Sappho, believed that it was Tachot whom Bartja meant to fetch, and fainted for relieved joy and happiness. Cambyes sprang to her help, and when she had recovered consciousness went on:

"Bartja is going to your own country, my wife—to Naukratis on the Nile—to fetch thence the granddaughter of a certain Rhodopis and daughter of a noble warrior, as his wife." The blow to her new-sprung happiness was too cruel, and Nitetis let slip the cup which her royal lover had given her and it fell ringing on to the ground. Cambyes, all his former suspicions of his princess's love for Bartja suddenly revived, broke up the banquet in disorder and dismissed the women to their quarters, forbidding any, under pain of death, to approach the palace of the hanging gardens.

That night, Boges, chief of the eunuchs, arranged that a young man resembling Bartja should gain entrance to the palace, and have an interview with the waiting woman of Nitetis, whom he loved and never had a chance of seeing. Boges, at the appointed time, led Croesus, the high priest, and some of the king's kinsmen, into the gardens on the pretence of showing them a marvelous blue lily that had just blossomed. These all saw a man, who looked like Prince Bartja, leap out of Nitetis' window and escape behind the cypresses. When the news was brought to the king he ordered that his brother should be strangled on the morrow, and the guilty Nitetis set astride upon an ass and flogged through the streets of Babylon.

Since the banquet, Nitetis had been closely guarded in her lonely palace, and she knew nothing of the evil plot which was being twined around her life. When Boges, therefore, with evil glee read to her the awful sentence of execution, in utter ignorance as to how she could have so angered the king, she resolved to take poison when the hour approached.

Before the sun had reached his midday height the news of what had happened and of what was still to happen had filled all Babylon. The streets swarmed with people, waiting impatiently to see the strange spectacle which the punishment of one of the king's wives promised to

afford. At the gate, called the Bel Gate, which led to the great western highroad, the throng was thicker than at any other point, for it was said that through this door, the one by which she had entered Babylon, the Egyptian princess was to be led out of the city in shame and disgrace. It only wanted a few hours to the time fixed for the spectacle, when a caravan approached the city, driving at great speed. Crying out that he had come to save Bartja, the idol of the people, Phanes, for it was he, soon procured an escort to the royal presence. Cambyses was lying on his purple couch, pale as death. At first he would not hear the testimony that the Greek offered, but some mysterious influence that Phanes exercised over him caused him to listen.

Not far from the walls of Babylon, Phanes related, his caravan had heard cries of distress and come upon a fearful scene. Three wild-looking fellows had just pulled a youth from his horse, stunned him with heavy blows and were on the point of throwing him into the Euphrates. They fled as Phanes approached, and he with horror gazed down upon what he believed were the features of Bartja. In his delirium, however, the wounded man discovered his identity, and babbled of the hanging gardens and some lovers' meeting there with a woman called Mandane.

"Mandane, Mandane," said Cambyses in a low voice. "If I do not mistake, that is the name of the highest attendant on Amasis' daughter. Fetch Boges and Mandane." The eunuch was nowhere to be found. He had vanished from the hanging gardens in an unaccountable manner, but Mandane was brought to the king's presence, and weeping confessed that, helped by Boges, she had met her lover in the palace of the Egyptian princess. The news had come too late to avert a tragedy: upon the approach of the hour set for her shame, Nitetis had swallowed poison.

On the twelfth day after her death, Phanes, who had really come to Persia to secure vengeance upon Prince Psamtik because he had stolen his children from Rhodopis' keeping, asked for an audience with the king. He told Cambyses that Nitetis was the daughter of the deposed Hophra, and not of Amasis, and that Amasis had deceived him in the matter. By the law, Nitetis' right to the throne

of Egypt descended to her husband, and Cambyses was lawful monarch of the land of the Nile.

Glad of something to distract him from his grief, Cambyses welcomed the prospect of a campaign in Egypt, for the ancients believed that only by constantly occupying their people in war could their vigor and manliness be maintained. He called a council of war, and appeared at table in royal robes instead of his mourning garments. The Arabians were secured as allies, and preparations for war set on foot.

In the meantime, Tachot, Amasis' own daughter, died. Once, in a crowd, she had seen Bartja again, for he had come to Egypt for his marriage to Sappho. She was ignorant of this, and believing it was for her sake that he had come, died happily. An hour later, Amasis the king, borne down by the news of the Persian advance upon Egypt, and his dearly loved child's death, died also.

Psamtik succeeded him on the throne of the Pharaohs, and one month before the time of the flooding of the Nile, the Persian and Egyptian armies were standing face to face, near Pelusium, on the northeast coast of the Delta.

Just before the great hosts joined battle, Psamtik gave Phanes' child over to the Greek mercenaries, saying that her father had betrayed his countrymen and country. And the wild troops killed her cruelly and drank her blood in her father's sight, as the troops were not more than a bow-shot apart, and then rushed on to the battle. At noon, fortune seemed favoring the Egyptians, but at sunset the Persians had the advantage, and when the full moon rose, the Egyptians were flying wildly from the battlefield, perishing in the marshes and in the Nile, or being cut to pieces by the swords of their enemies. Twenty thousand Persians and fifty thousand Egyptians lay dead on the blood-stained sea-sand.

Psamtik fled to Memphis, but he was followed and captured by Cambyses, and later lost his life urging the priests to rebel against their conqueror. The Persian king became monarch of Egypt, but his victory did not remove the longing for Nitetis from his mind. He sank into melancholy and madness, and finally perished as he was hastening back to Babylon.

THE NEXT STORY OF FAMOUS BOOKS IS ON PAGE 6235.

## THE CAPITOL SQUARE IN RICHMOND ON THE JAMES



The Capitol Square in Richmond, once seen, will never be forgotten. The dignified capitol building on the right was planned by Thomas Jefferson, on the model of the Maison Carree at Nîmes, France. During the Civil War the Confederate Congress met in this building. To the left is the City Hall. Several fine statues adorn the grounds, and in the Capitol itself is the only statue of Washington modeled from life. It is by the great French sculptor, Jean Antoine Houdon.

# The Book of THE UNITED STATES



Broad Street, in Augusta, Georgia, a beautiful Southern city.

## GLIMPSES OF THE SOUTHERN STATES

**T**HE settlement and the early history of the Southern States of our country are told in the History of the United States, which also tells of the great war between the sections. This article will show something of the South to-day, which has changed much since the Civil War.

First, we must decide what we mean by the South. Eleven states seceded and formed the Confederate States of America. They were Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Arkansas and Tennessee. Besides these, Maryland, Delaware, Kentucky and Missouri also held slaves and are sometimes called Southern States. West Virginia was made a state during the war, because few slaves were held in that part of Virginia, and the people did not wish to leave the Union. It is not really a Southern state. Oklahoma, one of the newest states, is sometimes called Southern and sometimes called Western.

These states are not all alike, for

the South is a large section. Even different parts of the same state may be very much unlike in surface and industries. The people also are very much unlike in the way they live and in their thoughts. What is true of one part is not true of another.

### HOW DOES ONE GET TO THE SOUTH?

From Washington several lines of railway lead southward. We may go to Richmond, one of the most interesting cities in the United States. It was founded soon after 1737 and in 1779 became the capital of Virginia. During most of the Civil War it was also the capital of the Confederacy. It is a beautiful city overlooking the James River, with large parks, beautiful drives, and stately homes.

From Richmond we may go westward to Charlottesville, to see the University of Virginia, founded by Thomas Jefferson; or we may go to some of the delightful resorts among the mountains; or we may go to Lexington, a spot sacred to the Southern people, for there General Lee spent his last years as president of



Washington College, and there Stonewall Jackson taught in the Virginia Military Institute. Both are buried there.

On the other hand we may go from Richmond down the river past the ruins of Jamestown, where Englishmen first succeeded in planting a permanent colony in our country, on our way to Norfolk and Newport News, both busy cities, on one of the best harbors in the world. There are great shipyards at Newport News, and perhaps we may see a ship launched. What a thrill it gives one to see the land where the first American state began to grow. Old Point Comfort, the site of Fortress Monroe, is a favorite resort for health and pleasure-seekers, winter and summer, and nearly always vessels of the United States Navy are in the harbor or the Navy Yard at Portsmouth.

#### ROANOKE ISLAND, WHERE SIR WALTER RALEIGH FAILED

From Norfolk it is a short journey to the eastern coast of North Carolina, with broad shallow sounds shut off from the sea by sand bars. We may visit Roanoke Island, where Sir Walter Raleigh tried three times to plant a colony, and see where the old fort stood. All this section is low and fertile, with so many streams that boats are used as often as carriages to go from place to place. Newberne is an old town, founded more than two hundred years ago by Swiss settlers, and further to the south is Wilmington, on the Cape Fear River, also an old town. It is an important port from which cotton and naval stores go to all parts of the world. During the Civil War it was one of the chief ports from which steamers ran the blockade, taking out cotton and bringing back manufactured articles, for which there was such sore need in the Confederacy.

In the centre of the state is Raleigh, the capital of the state, named for the man who planted three colonies in the state. Further to the west are Durham, Greensboro and Winston, all important manufacturing towns, which send their products to all parts of the world. At Chapel Hill, near Durham, is the University of North Carolina, founded in 1789, one of the oldest state universities.

Going southward from Greensboro, we are seldom out of sight of a furniture factory or a cotton mill, until we reach Charlotte, the largest city in the state, and a

centre of the cotton industry, for North Carolina has more mills than any other state. Perhaps, however, we turn west at Salisbury and go to Asheville among the mountains, or to some of the other resorts in the "Land of the Sky." Thousands of tourists visit these mountains every year. In summer they come from the South; in winter from the North.

#### CHARLESTON, THE BEAUTIFUL OLD CITY WHERE THE WAR BEGAN

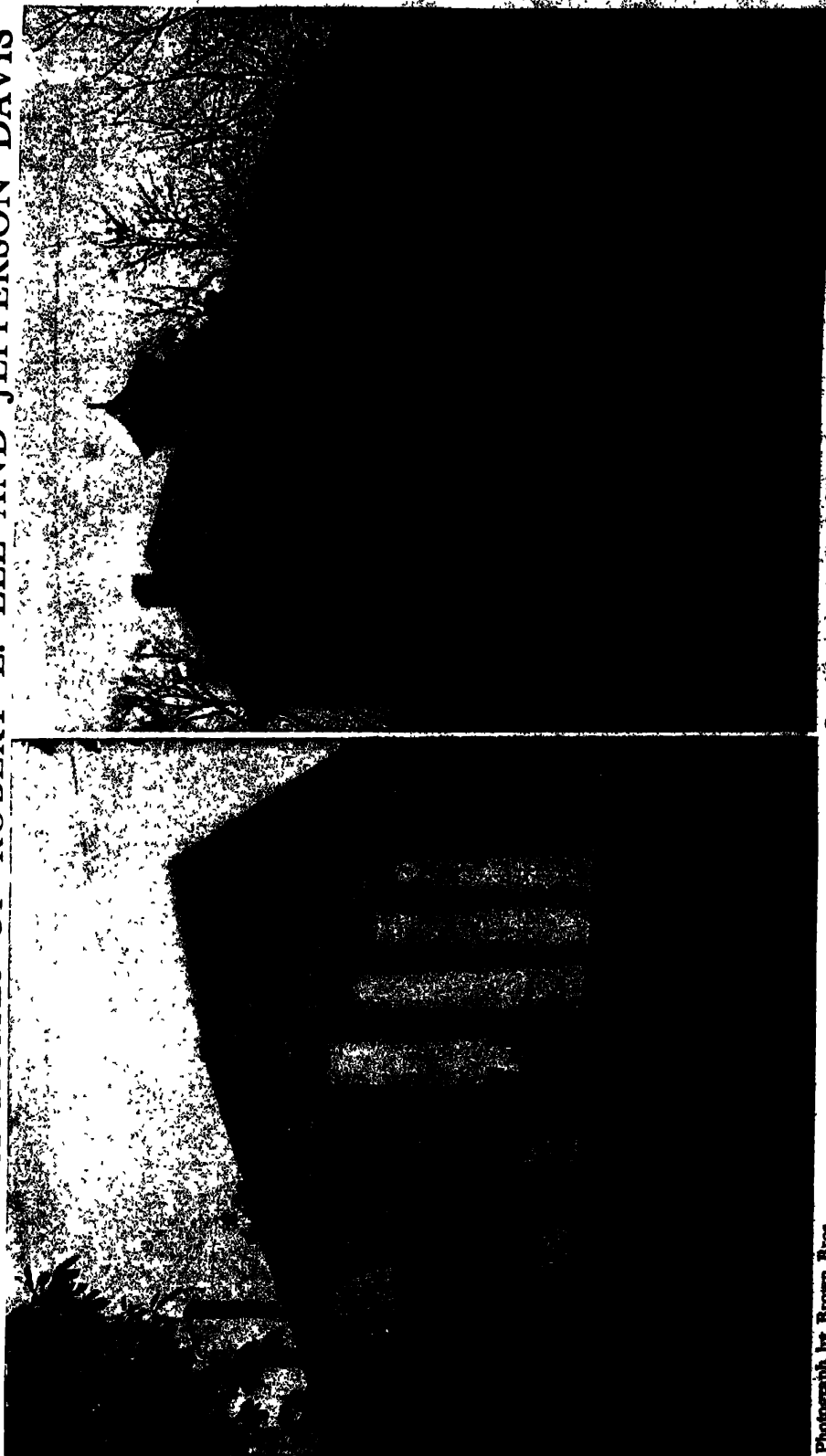
One speaking of South Carolina always thinks first of Charleston, the beautiful, some pictures of which we show on another page. The low country in which Charleston is situated is famous for the production of the sea-island cotton, and of rice. In some sections few white people live, and we see black faces almost entirely. More than half the people of this state are negroes. Columbia, the capital, was burned after its capture by General Sherman in 1865, but has been rebuilt. Its broad streets, with their fine trees, its monuments and public buildings, and its great manufacturing establishments make it worth a visit. Aiken is a famous winter resort.

There are other thriving towns in South Carolina but we are now on our way to Atlanta, the chief city of Georgia. Nearly all of the cities and towns we have mentioned are old, but we come now to a town which is comparatively new. It was well-situated for trade, and was beginning to gain importance before the Great War. Since that time it has grown rapidly and is often compared to the Western cities. The principal business streets are bordered by high buildings and there are many fine residences on others. Atlanta was the home of Joel Chandler Harris whose Uncle Remus stories all of you have read.

#### THE COTTON FIELDS AND THE FORESTS OF GEORGIA

The state grows much cotton and manufactures much that it grows. The pine trees furnish tar, pitch and turpentine. The two chief cities in the eastern part are Augusta, on the Savannah River, over two hundred miles from the mouth, and Savannah, only a few miles from the sea. Both are important manufacturing cities, both send ships to all parts of the world, and both are popular winter resorts. Sea-island cotton grows on the coast, and raising fruits and vegetables for the northern markets is also an im-

# THE VIRGINIA HOMES OF ROBERT E. LEE AND JEFFERSON DAVIS



Photograph by Brown Bros.

These two homes are particularly interesting to Southern boys and girls. The one on the left is Arlington, just across the Potomac from Washington, which belonged to Mrs. Robert E. Lee. It now belongs to the United States, and the grounds are a National Cemetery. The other house was occupied by Jefferson Davis while he lived in Richmond, and is sometimes called "The White House of the Confederacy." It is now a Confederate museum, and contains many relics of distinguished Southerners.

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portant industry. We are now getting so far south that winter is hardly more than a name; though ice forms occasionally during the colder months.

# **THE LAND WHERE IT IS ALWAYS SUMMER**

South of Georgia is the state with the longest coast line, Florida, stretching out like a long finger into the sea. It is almost entirely an agricultural state, except for the manufacture of tobacco and lumber. Raising tropical fruits and vegetables for the northern markets is the chief industry. Oranges, grapefruit and pineapples are known to us all. Strawberries ripen before the snows are gone in New England, and many other berries are also grown.

Early vegetables are sent to the northern markets before gardens are even planted in that section. Much of the southern part of the state is a swamp, known as the Everglades, inhabited only by Indians and a few white men who have pushed their way into the wilds.

Alligators, snakes and tropical birds abound, but the plume-hunter has almost destroyed several species of the birds for their feathers. These swamps are now being drained so that the land can be cultivated.

The climate draws thousands every year who seek to escape the cold of their homes, and for their accommodation many gorgeous hotels have been built. St. Augustine, the oldest city in the United States, Tampa and Palm Beach are among the leading resorts. Jacksonville is the largest city, but the capital is Tallahassee.

# **ALABAMA, A STATE OF COTTON, COAL AND IRON**

Our next state is Alabama, low and swampy in the south near the Gulf, but hilly further north, with mountains of coal and iron. Here were, and still are, great plantations upon which hundreds of negroes work. In some counties they outnumber the whites five to one. The state is one of the largest producers of cotton, but has also great mineral wealth. Mobile, on Mobile Bay, opening from the Gulf of Mexico; is an old city which was once the capital of the Louisiana Territory, and has been in turn under French, British, Spanish and American control.

Montgomery is the capital, and here the Confederate government was organized February 4, 1861. Birmingham,

sometimes called the Southern Pittsburgh, manufactures much iron and steel, and has grown into a city on that account. At Tuskegee is the Tuskegee Institute for the education of colored people in various trades. Booker T. Washington was the first president.

# **SOME OF MISSISSIPPI BELOW THE LEVEL OF THE RIVER**

The adjoining state of Mississippi is also a great producer of cotton, though other crops also grow well as the soil is very rich. Along the Mississippi, great banks called levees have been built to protect the fields from overflow by the floods of the great river. Nearly all the people live in the country, as the cities are small. More than half the population is composed of negroes. Natchez and Vicksburg, on the Mississippi, are the chief cities. The latter was fortified by the Confederate armies during the Civil War and was only taken after a long siege in 1863, by the Union forces under General Grant, as you may read on another page. The capital is Jackson, near the centre of the state.

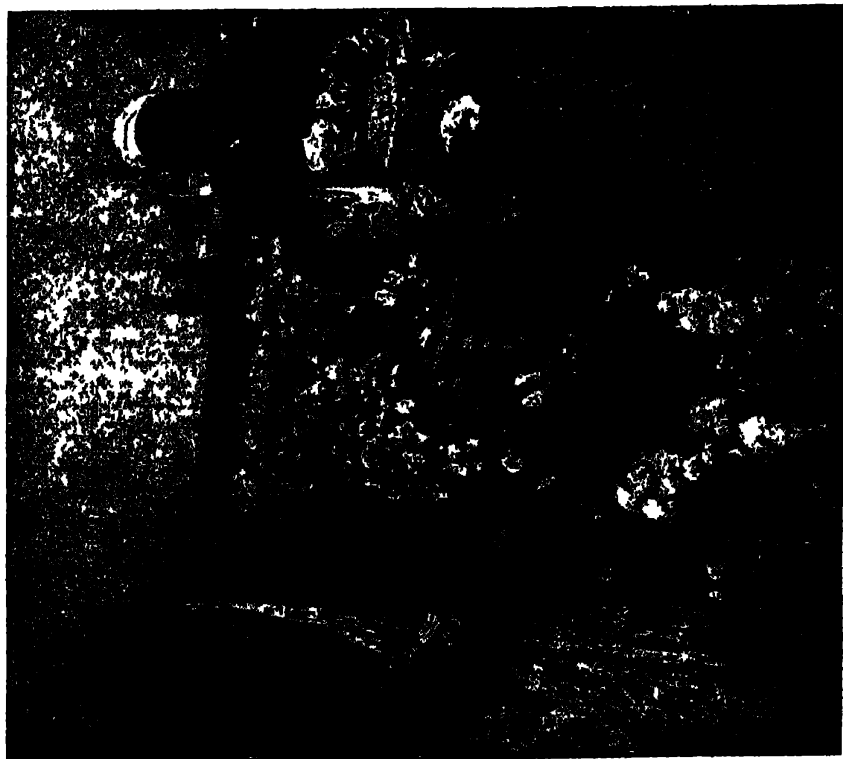
You may read on page 1396 how the great Louisiana Territory was purchased by the United States, and to this day signs of its former French ownership still may be seen. Some of the inhabitants speak only French, though the number of such is growing smaller. In New Orleans, the chief city, one part is called the "French quarter," and shows many quaint reminders of bygone days. This city is below the level of high water in the Mississippi, which is kept out by the levees. In the cemeteries the dead are buried in vaults constructed above the ground. The Carnival is held in the spring, ending with Mardi Gras, the last day before Lent, and attracts thousands of visitors. The city is noted for its flowers.

There are no other large cities. Shreveport, and Baton Rouge, the capital, are the largest. The state raises most of the sugar-cane grown in the United States, as well as much cotton, rice and corn. The forest wealth in pine and cypress is enormous.

# **TEXAS IS LARGER THAN MOST COUNTRIES OF EUROPE**

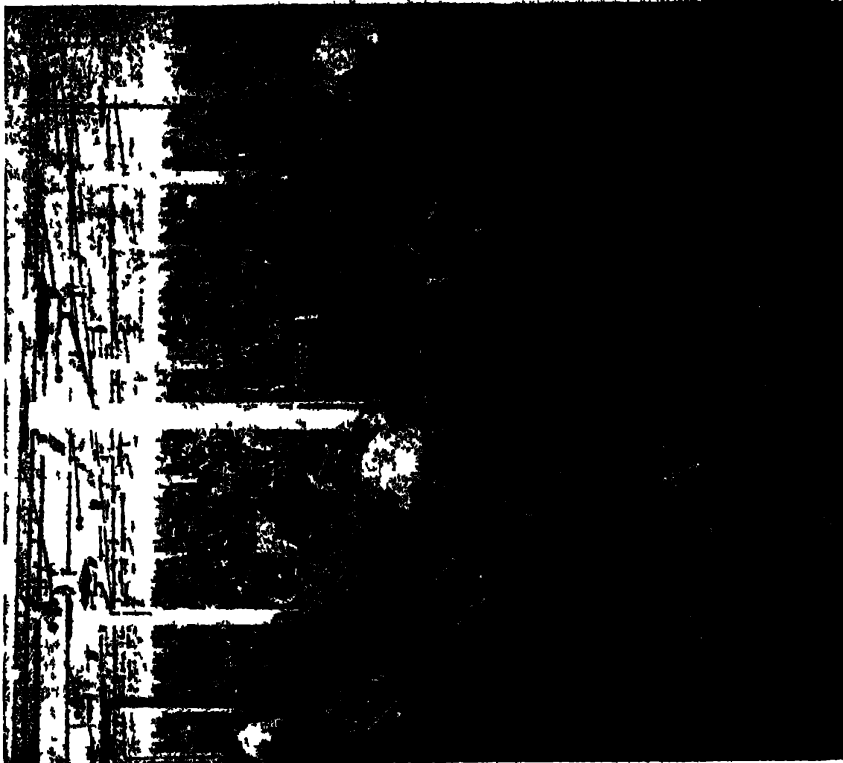
Leaving Louisiana and crossing over into Texas brings us into an empire which would require a book to describe. It is the largest state in the Union. Some counties are larger than several

## COTTON FIELD AND COTTON MILL IN NORTH CAROLINA



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North Carolina has become one of the leading states in the manufacture of cotton, which is very often grown in fields around a mill. Here are cotton pickers at work, and also the immense weaving room of the White Oak Mills of Greensboro, where cotton is being transformed into cloth. Though negroes cultivate and pick the cotton, they seldom work in the mills. That work is done by white men, women and children, most of whom have come from the farms to the mills. The mills are generally in villages. Few are in cities. In fact there are few cities, or even large towns, in North Carolina. North Carolina has more cotton mills than any other state, but many are small.



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North Carolina has become one of the leading states in the manufacture of cotton, which is very often grown in fields around a mill. Here are cotton pickers at work, and also the immense weaving room of the White Oak Mills of Greensboro, where cotton is being transformed into cloth. Though negroes cultivate and pick the cotton, they seldom work in the mills. That work is done by white men, women and children, most of whom have come from the farms to the mills. The mills are generally in villages. Few are in cities. In fact there are few cities, or even large towns, in North Carolina. North Carolina has more cotton mills than any other state, but many are small.

states. In population it ranks fifth and is growing rapidly. Almost every variety of soil is to be found, and many different crops can be grown. Though for a long time cattle-raising was the chief industry, agriculture now holds the first place, and considerable manufacturing is developing. There are yet, however, many great ranches where thousands of cattle feed.

As you have read in another volume, Texas was once a part of Mexico and gained independence by hard fighting. Along the Rio Grande, which now separates the state from Mexico, the influence of that nation is strong. The inhabitants of Texas have come from every state in the Union, and there is room for thousands more.

The chief cities are San Antonio, a picturesque city founded by the Spaniards about two hundred years ago; Dallas, a thriving manufacturing city; Galveston, the principal port; El Paso, on the Rio Grande, just across from Mexico; Houston, named for Sam Houston, the great Texan, and Austin, the capital.

West of Texas lie the new states of New Mexico and Arizona, but their population is small as yet, and they belong to the West rather than to the South. The new state of Oklahoma, north of Texas, was until recently Indian Territory, and was not a part of the Confederacy. This state has increased rapidly in population, and the people are prosperous. The capital is Oklahoma City. Towns grow up in this state, almost in a night.

#### ARKANSAS HAS A GREAT VARIETY OF SURFACE

Arkansas, north of Louisiana, is almost altogether a farming state, though the mineral wealth is considerable, and the forest wealth is very great. Next to the Mississippi, the land lies low and is very fertile, and the same is true of the land along the Arkansas River, which divides the state into almost equal parts.

The only city of considerable size is Little Rock, which is also the capital. Hot Springs is a flourishing little city, which has grown up around many springs of hot water, which have medicinal properties. Thousands visit these springs every year to bathe in the waters, and to drink the waters of some of them. The springs are owned by the United States.

#### TENNESSEE IS AN INTERESTING STATE FOR MANY REASONS

We may now turn eastward and cross the Mississippi into Tennessee at Memphis, on the only bridge across the stream south of St. Louis. This is the largest city in Tennessee, has a great trade up and down the river, and is becoming an important manufacturing city.

The state itself is one of the most interesting in the Union for many reasons. It was originally a part of North Carolina, which gave up its rights just after the Revolution. Almost every variety of soil and climate may be found, as we go from the lowlands below the level of the Mississippi, eastward through a fine agricultural and grazing country to the high mountains, which separate it from North Carolina. Along the Mississippi the vegetation is almost tropical, while in the mountains many plants and trees which are generally found much further north grow freely.

The capital is Nashville, a beautiful city, important in the Civil War. Vanderbilt University, George Peabody College for Teachers, and other educational institutions are located here. Chattanooga, near the Georgia line, is a thriving manufacturing city. Here one of the bloodiest battles of the Civil War was fought. Knoxville is also a thriving city.

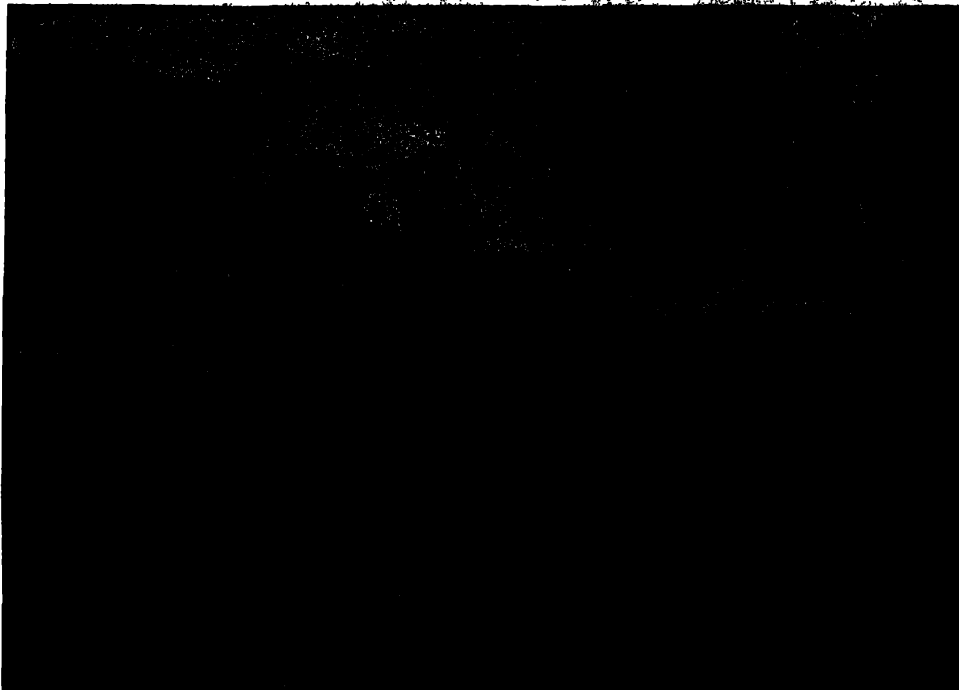
#### WHAT WE DO NOT TELL ABOUT THE SOUTH

Now we have told something of all those states which seceded, and tried to form a new nation, but which are now thoroughly and entirely a part of the United States. Many of the people of Missouri and Kentucky, as well as of Maryland and Delaware, like to call themselves Southerners, but we have not space to speak of those states just now.

Much could be written of life in the South, of the negroes, of the sports, manners and customs of the people, but all these must be left for another time. All the Southern States have increased greatly both in population and wealth since the Civil War. Some are rapidly becoming manufacturing states, instead of devoting almost all their attention to agriculture. The most important industries are the manufacture of cotton yarn and cloth, cotton seed oil, furniture and other articles of wood, tobacco, iron and steel, but there are many others.

THE NEXT STORY OF THE UNITED STATES IS ON PAGE 6071.

## CHARLESTON, THE BEAUTIFUL



The most fashionable residence district of the delightful city of Charleston is the Battery on the water front. No city in the United States is more attractive as a place of residence. This charm has always been a part of Charleston, and is felt by every visitor. The capture of Fort Sumter in the harbor, in 1861, by the newly organized Confederate forces, was the beginning of the Civil War.



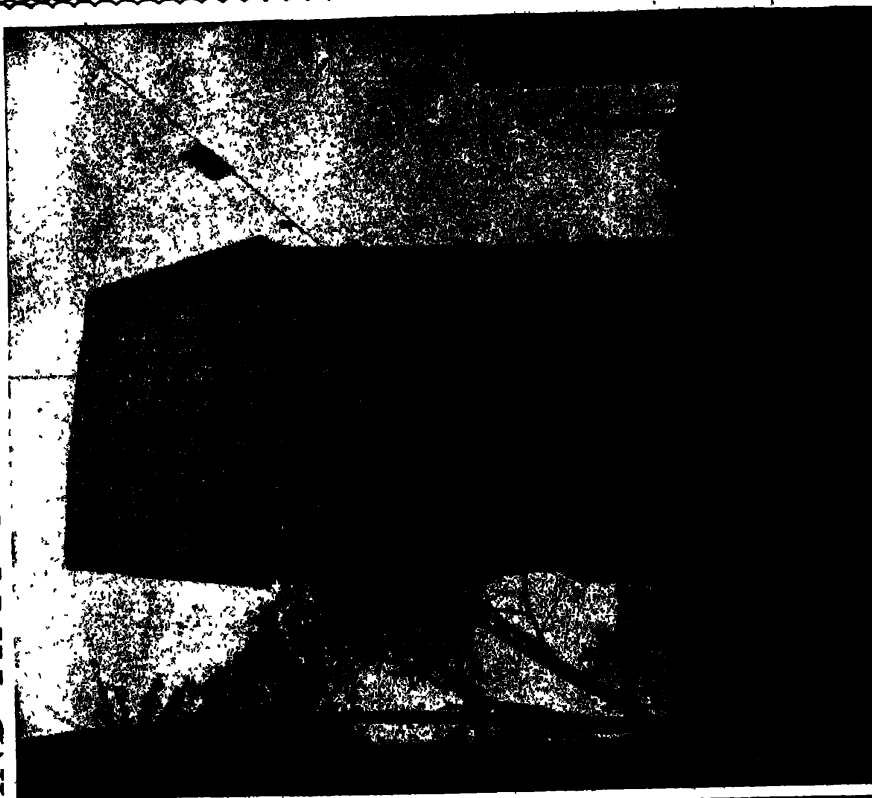
Though Charleston is a beautiful city with a restful atmosphere, it is also an important port. From its docks ships sail to Europe carrying cotton, rice and many other things. This is the Commercial Wharf. The bales of cotton shown may soon be on the other side of the world. The South is the world's great source of cotton and sends abroad more than half of the crop raised in the section.

## ATLANTA IN WAR TIME AND FIFTY YEARS LATER



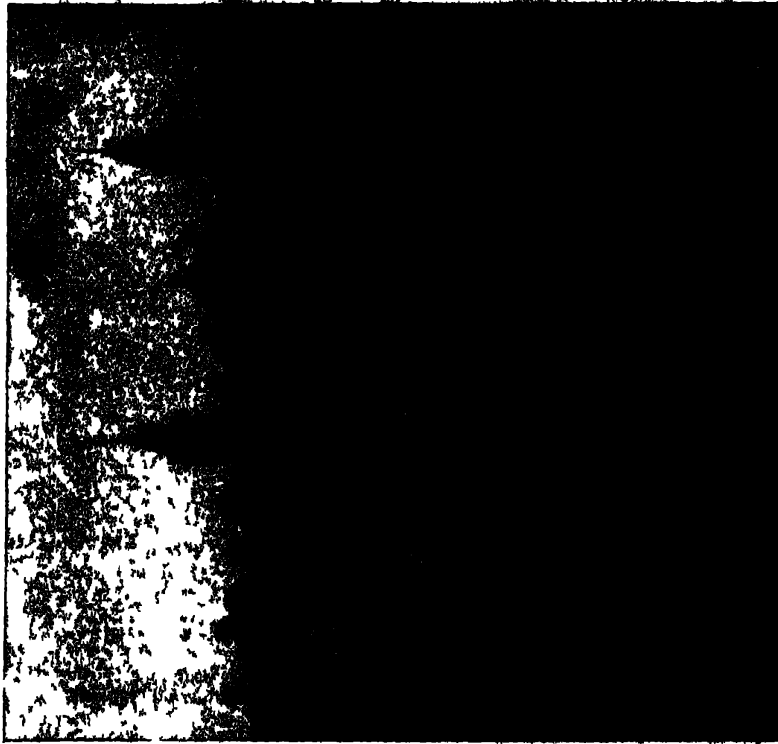
Photograph by Brady.

On November 17, 1864, during the Civil War, the greater part of Atlanta was burned by order of General Sherman, who had captured the town after hard fighting. Its growth since that time has been marvelous, both in population and wealth. The Candier building shown here is only one of many great office and manufacturing buildings in the thriving city. Many great establishments in other sections have their Southern offices in Atlanta, which is a great railroad and manufacturing centre of the South.



Picture from Brown Bros.

## THE OLDEST CITY IN THE UNITED STATES



You were told of the founding of St. Augustine in 1565, and that it is the oldest city in the United States. Now that you are here, you can see for yourself that while Florida was still a possession of Spain. Near it you see telephone wires, a mail box and a car. On the right is one of the many old houses in which thousands go every year to escape the cold of northern winters. There are many of these winter homes at St. Augustine, some of them very large and very beautiful.

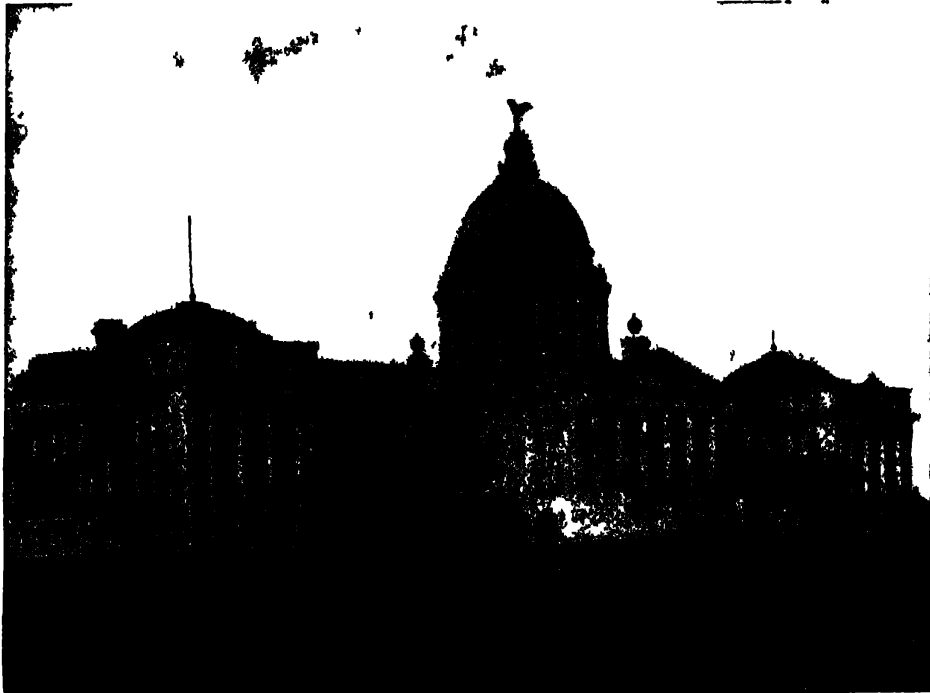
Pictures copyright by H. C. White Co.



## THE CAPITOLS OF TWO SOUTHERN STATES



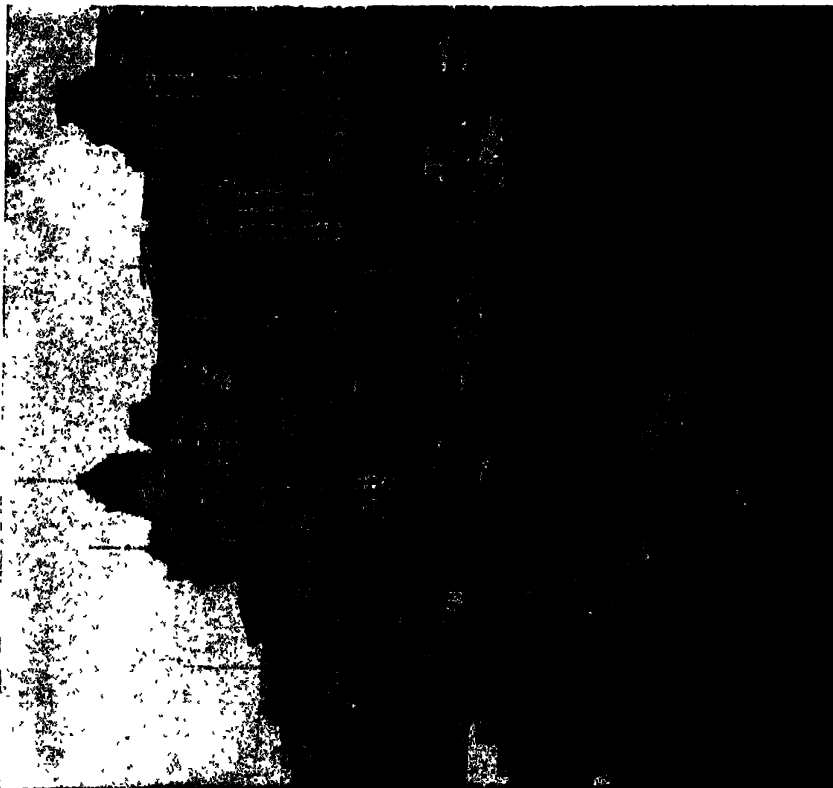
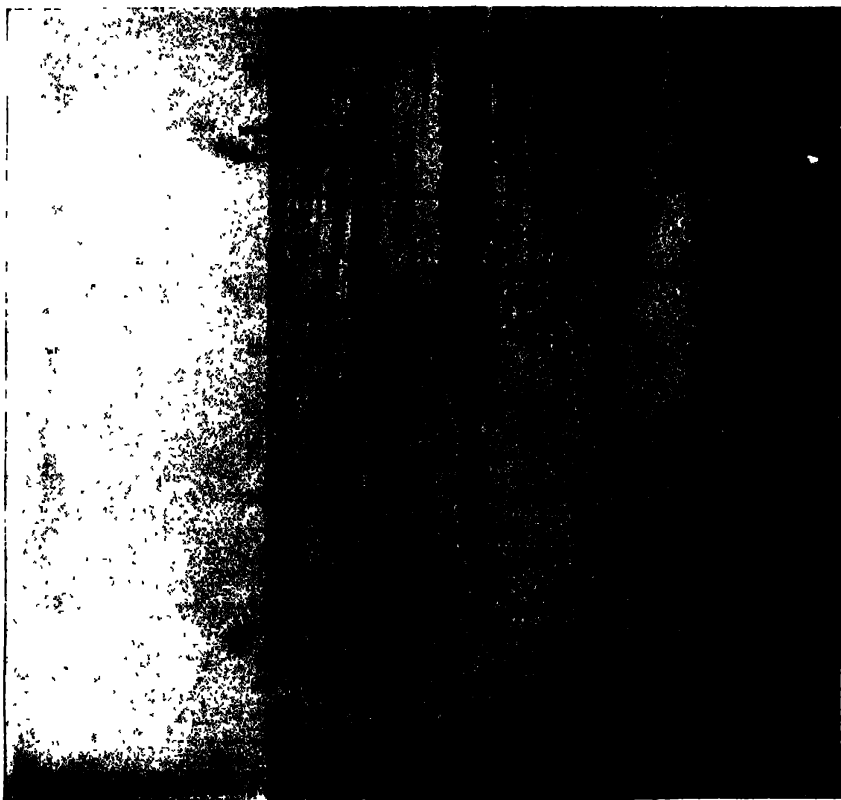
Situated at the end of a broad street in the pleasant little city of Montgomery is the Capitol of Alabama. Here the delegates from seven Southern states met in February, 1862, and formed the Confederate States of America. The seat of government was soon changed, however, to Richmond.



This is the Capitol of Mississippi at Jackson, a very dignified building, evidently modeled after the National Capitol at Washington, though with many changes. If you will study the pictures of Greek architecture given elsewhere you will see how much our public buildings have been influenced by men who lived more than two thousand years ago.

Pictures from Brown Bros

## TWO VIEWS IN NEW ORLEANS, THE CRESCENT CITY



New Orleans, the largest city in the South, is built on the Mississippi River, more than one hundred miles from the mouth. It is built on a bend of the river, and is often called the "Crescent City." As much of it is below the level of the river, great banks called the levees have been built to shut out the water, and these also serve as wharves. Our pictures show steamers loading at the levee, and Canal Street, one of the principal thoroughfares of the city. This street divides the old French portion of the city from the newer American part. New Orleans is unlike any other American city, and thousands of tourists from other parts of the country visit it.

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## COUNTRY AND TOWN IN TEXAS



Texas is an empire in itself, and can support a population many times larger than it has at present. It is the leading state in cotton, but can grow almost any crop produced elsewhere. This is a field of Kafir corn, one of the best food crops for cattle, but in Africa, India and China the seeds are used for human food also. This crop was grown near Amarillo, Texas, and the yield is very heavy.



Dallas is not only the leading manufacturing city of Texas, but is also the leading cotton market of the United States away from the seacoast. The surrounding country is very fertile, and the city is growing rapidly in population and wealth. It is a railroad centre, an educational centre, and is being developed according to a city plan drawn up by experts. High commercial buildings are being constructed.

## CHATTANOOGA AND NASHVILLE, TENNESSEE



Around Chattanooga, now so peaceful and prosperous, were fought some of the fiercest battles of the Civil War. The mountain beyond the city is Missionary Ridge. On November 25, 1863, a Federal army under General George H. Thomas took by storm these heights defended by Confederates under General Braxton Bragg. Chattanooga was in turn in possession of Confederate and Federal armies.



The state Capitol at Nashville, Tennessee, stands on a considerable elevation and looks somewhat like a fortress. In fact during the Civil War it was so occupied, and the walls yet bear the marks of shells. Tennessee was originally a part of North Carolina, and the first settlers came from that state and from Virginia.

Photographs by Brown Bros

## THE GIRL WHO PLUCKS THE TEA FOR YOU



The picking of the leaf is now practically the only part of the industry in which the tea is touched by hand. This woman, as she plucks the young leaf-shoots, puts them into the basket on her back.

Photographs on these pages are taken by the India Tea Association, Davidson & Co., Underwood & Underwood, and others.



Tea-pickers at play after a day in the tea gardens in India.

## THE STORY IN A TEACUP

WE think little enough of the tiny leaf which floats in our cup of tea, yet the little leaf has had a world of adventure. It may have grown in China, or in India or Ceylon. It has sprung up on land rich with the leaves and fibres of a dead forest; it has borne the intense heat of the sun, and flourished through the heaviest rains.

It may have reached its prime on a sheltered plain, or attained perfection on a loam-strewn mountain-side. And when the life of the leaf upon the plant is ended by the picker, complicated machinery takes it and bakes it, ferments it and sorts it and packs it, and sends it forth.

Nobody can say certainly where the first of these plants grew, but it is believed that tea was first used in China, not for the preparation of a beverage but for a medicine. By the eighth century the custom of tea-drinking was so popular there that the first of a long series of taxes was imposed upon the article. After that tea-drinking spread rapidly among Chinese peoples, and since it became known to Western countries in the seventeenth century "China" and "tea" have been inseparably connected.

The gigantic tea industries of India and Ceylon which have grown up in the last century have to a large

CONTINUED FROM 5987

extent ousted Chinese tea from the markets of the world. Still, China has such an

enormous population of her own tea-drinkers to supply that it is probable she will continue to be the chief tea-producing country in the world, even if she does not export so much to other lands.

Excluding China and Japan, the principal tea-drinkers are the peoples of the United Kingdom, British Colonies, Russia and the United States. When tea first made its appearance in England early in the seventeenth century, it was so great a novelty that people paid from \$30 to \$50 a pound. At such a price it could never have become popular, but fully a hundred years later it still realized five dollars, or more a pound in London, and the principal shop at which it was sold combined the business of tea-dealing and banking. As more tea came, prices became lower, and so great was the demand that the fastest ships were devoted to the tea trade. As soon as they got their cargo they raced home, and the ship which arrived first got the best price for the new season's crop. In 1866 three little sailing ships left Foochow, on the coast of China, together, made the voyage of fully 16,000 miles in ninety-nine days, and were docked in London within two hours of one another.

The use became common in America before the Revolution.

With the growing demand for tea from China, the East India Company thought that they might introduce the growth into India, and sent to China for seeds. But before the messengers returned tea was discovered growing wild in Assam. Planters lost no time in cultivating it, and in 1843 the first cargo of Indian tea was sent to London.

A tea plant is ready for the picker when it is about four years old. The pickers, carrying a basket slung upon their shoulders, and supported by a band passed round the forehead, enter the plantation, and go from tree to tree. They take only a few buds and young tender leaves from each, and as they pick toss them into their baskets, which, when filled, are carried to the factory, and their contents weighed. The plant continues to grow all through the warm, rainy season, and picking goes on from day to day as new leaves come out.

#### WHAT HAPPENS AT THE FACTORY

At the factory the process of preparing tea is carried out. The tea is first emptied out on to shallow trays, and a pound of tea covers an area a yard square. The trays are then carried to a heated room, through which a strong current of air is forced. This is to soften and wither the tough leaf, which is ready when it has become quite soft and flaccid, a process which usually occupies from eighteen to twenty hours. Special machines consisting of cylinders rotating in hot air are sometimes used instead of the open trays. Next the leaves are passed through a machine which curls them, and presses the juice out on to their surface. Following this the tea is spread out in darkened rooms or placed in drawers, in layers one or two inches thick, and covered with damp curtains, so arranged that they do not actually touch the leaves. The heat and moisture cause the tea to ferment, after which it goes through a sort of baking process for a few minutes to arrest fermentation and to dry out the moisture caused by it. During fermentation the leaf changes its color, until it becomes a bright copper shade, and the flavor of the tea develops.

The leaves have now to be sorted into sizes and qualities, sieves of various

meshes being employed for the purpose. Then, after a second drying, the tea is ready for market. It is packed by machinery into chests lined with lead, and away it goes to the ship.

The process, of course, varies in different districts. Great care must be exercised in the choice of wood for the chests, because tea readily absorbs odors and thereby loses its own flavor. A particular three-ply wood consisting mainly of pine-wood is now much used.

So far we have been speaking of the Indian method of treatment, in which, from the time that it is picked, the tea is not handled at all. In China it is different. There the tea is rolled by hand and trodden by foot. Machinery is now being slowly introduced.

For many years attempts have been made to grow tea in the United States, and there are tea-gardens of considerable size at Summerville, South Carolina, and at Pinehurst in North Carolina. Several thousand pounds a year of excellent tea are produced, but the cost of labor is so much more than in the East, that only expensive grades can be produced at a profit.

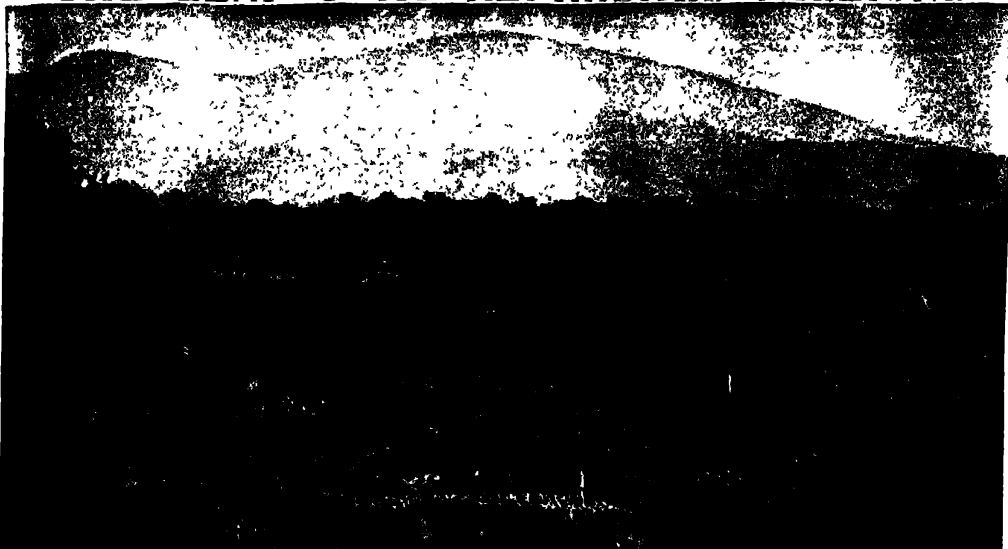
#### WHEN THE TEA SHIP ARRIVES

The tea trade is very important, and the way the tea is handled in Great Britain is interesting. When it arrives samples are drawn from the cargo and sent to the merchants, who submit them to the tea-taster, so that they may have his opinion on the quality and the value of the shipment. He has a tiny pot of tea made from each, and takes a sip from each brew. Those that he likes he commends, and the merchant buys them at the sale.

When the tea reaches the merchant's warehouse it has to be blended. The merchant has a book in which are recorded all the different qualities of the water supplied to various districts. For each district there is a special blend. A tea which would be satisfactory if brewed in one part of the country would be quite unsuitable to the water of another part, and blending is therefore one of the important features of the industry. Formerly it was done by men with shovels on a floor: now it is done in immense rotating drums which thoroughly mix the selected kinds.

CONTINUED ON PAGE 6050.

## THE LEAF THAT REFRESHES MILLIONS



Although tea was introduced into England less than 300 years ago, no less than 295,000,000 pounds is now used in the United Kingdom in a single year. This shows how the shrubs are cultivated in rows.



The tea plant is an evergreen shrub with leathery leaves, and white flowers which change into woody seed-vessels. Our teas generally consist of dried leaves of several varieties of tea plant blended together.



## WHAT A TEA GARDEN IS LIKE IN INDIA



Originally nearly all the tea came from China, in 1843 a pound of tea came to London from Assam,—the beginning of the tea trade of India, where half a million people are employed gathering the leaves.



Many of the tea-pickers are boys and girls, like these little Cingalese, and are quite as quick and skilful at their work as the grown-ups. India and Ceylon now produce 500 million pounds of tea a year.

## A TEA GARDEN IN NORTH CAROLINA

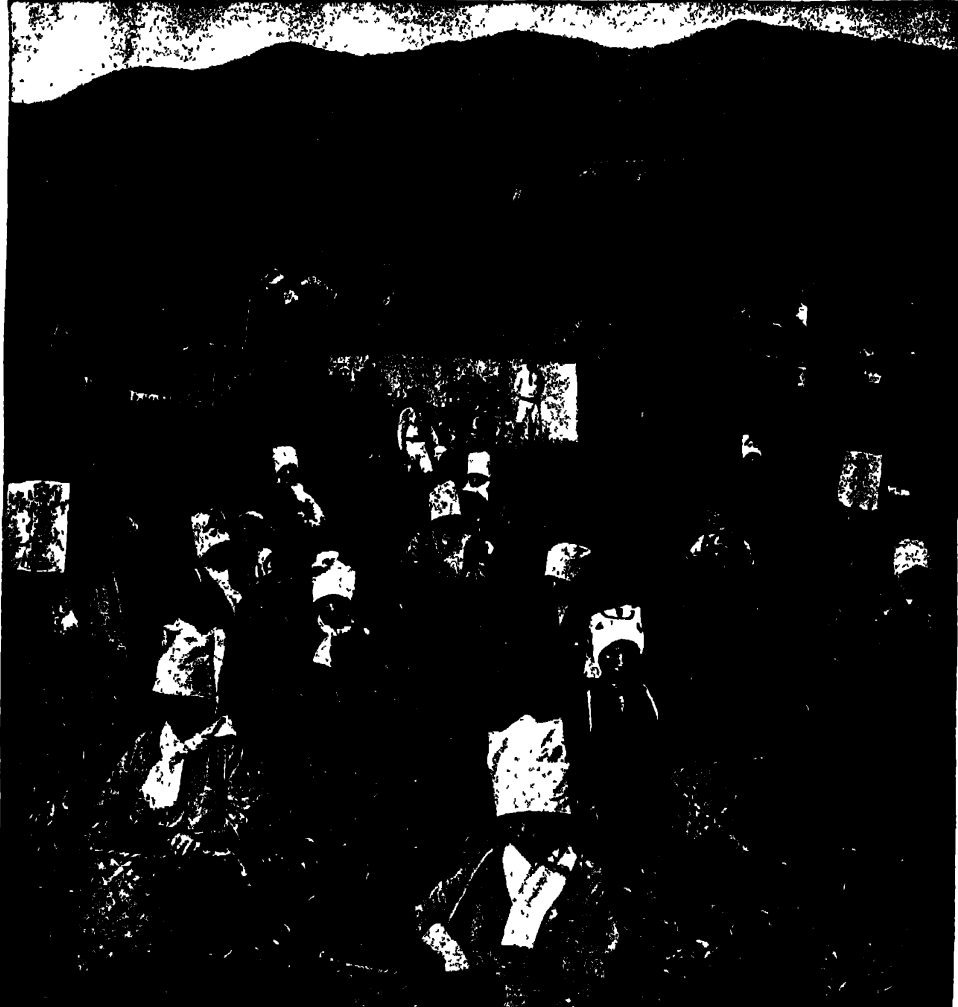


For years attempts have been made to grow tea in the United States, and success has finally come. Both in North and South Carolina are flourishing tea gardens. These pictures show a part of the gardens at Pinehurst, North Carolina. The land devoted to tea is surrounded by slender young pines. The plants in this part of the garden had grown old and straggling, and were cut back almost to the roots.



The pickers here are chiefly negro women and children, who pick the leaves carefully to avoid bruising them, and deposit them in the baskets. This garden produces an especially fine quality of black tea. The tea plants here seem to be able to withstand cold weather without great damage. Travelers say that they have never seen finer plants in Ceylon or India. Compare this picture with other pages.

## A HAPPY TEA PARTY IN A JAPANESE GARDEN



Three-quarters of a century ago China supplied most of the world's tea, but since that time other countries have grown immense quantities of tea, and Japan now produces more than forty-five million pounds a year.



The Japanese women in the tea plantations frequently carry their babies tied to their backs, as were shown. Japan exports much green tea, which is from the same plant as black tea, but is not fermented. Photographs copyright by Underwood & Underwood.

## WEIGHING THE TEA AND PAYING THE PICKERS



Twice a day the coolies bring their baskets of leaves to the factory, that the stock which they have picked may be weighed, and it is a very picturesque sight when they are gathered together, as shown here.



Pickers are paid according to the weight of leaves brought in, and there is much excitement as the baskets are placed on the scale. Of course, the quantity picked varies according to the skill of the pickers.



Even more exciting than the weighing is the paying of the wages. The pickers line up and approach the paying-out clerk in procession, each checking his or her money before passing to make room for the next.

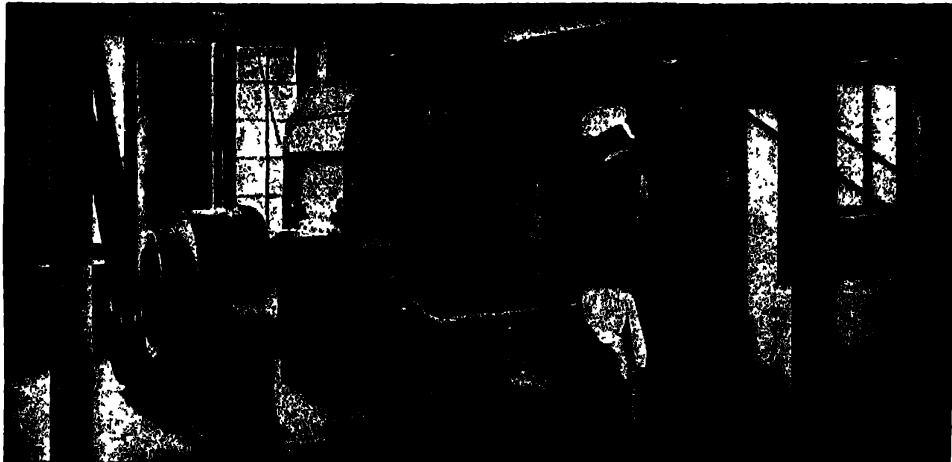
## THE TEA LEAVES ARE SIFTED AND DRIED



During the rainy season, when young leaf-shoots are forming, leaves are picked every eight or nine days. At the factory they are spread out on racks, as shown here, so that some of the moisture may evaporate.



The leaves are next rolled to crush their cells and release the juices, then spread out in the air, rolled again, and fired or baked, after which the leaves are separated from the stalks and sifted, as shown here.



The tea is now fired once again, being placed on trays in what is called a drier, while currents of hot air are passed gradually over it until the leaves are firm and crisp. It is then ready for packing.

## PACKING THE TEA FOR ITS LONG JOURNEY



The Chinese still pack tea in the old-fashioned way. It is put into large cases lined with lead foil, and is trodden in by the coolies with their bare feet. Then the foil is closed over, and the lid is nailed down



Modern methods prevail in India and Ceylon, whence much tea comes. There, much of the tea is packed ready for the stores in small packets, the metal foil covering being soldered down to keep the tea air-tight.

## SENDING THE TEA OUT TO THE STORES



The tea that comes over in large cases is bulked and blended in the warehouses. This means that cases of various kinds of tea are emptied out in one great heap on the floor, and mixed by men or by machines.



Then it is packed back into the large cases, pressed down tightly, and sealed up ready for the stores. Australians and New Zealanders are the biggest tea-drinkers in the world, and the English come next.

# The Book of POETRY

## A COURT LADY

"A COURT LADY" was written by Elizabeth Barrett Browning. Both Mrs. Browning and her famous husband were deeply interested in the struggle for a united Italy and both wrote many poems dealing with this subject. The Brownings lived in Italy for a great number of years, and learned to love it as dearly as they did their own native land of England. Among Mrs. Browning's other well-known poems dealing with Italy is one entitled "Mother and Poet."

HER hair was tawny  
with gold, her  
eyes with purple were  
dark,  
Her cheeks' pale opal burnt with a  
red and restless spark.

Never was lady of Milan nobler in  
name and in race,  
Never was lady of Italy fairer to see  
in the face

Never was lady on earth more true as  
woman and wife,  
Larger in judgment and instinct, prouder  
in manners and life.

She stood in the early morning, and said  
to her maidens, "Bring  
That silken robe made ready to wear at  
the court of the king.

"Bring me the clasp of diamonds, lucid,  
clear of the mote,  
Clasp me the large at the waist, and clasp  
me the small at the throat.

"Diamonds to fasten the hair, and dia-  
monds to fasten the sleeves,  
Laces to drop from their rays, like a  
powder of snow from the eaves."

Gorgeous she enter'd the sunlight which  
gather'd her up in a flame,  
While, straight in her open carriage, she  
to the hospital came.

In she went at the door, and gazing from  
end to end,  
"Many and low are the pallets, but each  
is the place of a friend"

Up she pass'd through the wards, and  
stood at a young man's bed:  
Bloody the band on his brow and livid the  
droop of his head.

"Art thou a Lombard, my brother?  
Happy art thou," she cried,  
And smiled like Italy on him: he dream'd  
in her face and died.

Pale was his passing soul, she went on  
still to a second:  
He was a grave hard man, whose years by  
dungeons were reckon'd.

CONTINUED FROM 5901



Wounds in his body  
were sore, wounds in  
his life were sorer.  
"Art thou a Romagnole?"  
Her eyes drove lightnings  
before her.

"Austrian and priest had join'd to  
double and tighten the cord  
Able to bind thee, O strong one,—  
free by the stroke of a sword.

"Now be grave for the rest of us, using  
the life overcast  
To ripen our wine of the present, (too  
new,) in glooms of the past."

Down she stepp'd to a pallet where lay a  
face like a girl's,  
Young, and pathetic with dying,—a deep  
black hole in the curls.

"Art thou from Tuscany, brother? and  
seest thou, dreaming in pain,  
Thy mother stand in the piazza, searching  
the lists of the slain?"

Kind as a mother herself, she touch'd his  
cheeks with her hands:  
"Blessed is she who has borne thee, al-  
though she should weep as she stands."

On she pass'd to a Frenchman, his arm  
carried off by a ball:  
Kneeling . . . "O more than my brother!  
how shall I thank thee for all?"

"Each of the heroes around us, has  
fought for his land and line,  
But *thou* hast fought for a stranger, in  
hate of a wrong not thine.

"Happy are all free peoples, too strong to  
be dispossessed:  
But blessed are those among nations, who  
dare to be strong for the rest!"

Ever she pass'd on her way, and came to  
a couch where pin'd  
One with a face from Venetia, white with  
a hope out of mind.



Long she stood and gaz'd, and twice she  
tried at the name,  
But two great crystal tears were all that  
falter'd came.

Only a tear for Venice? she turn'd as in  
passion and loss,  
And stoop'd to his forehead and kiss'd it,  
as if she were kissing the cross.

Faint with that strain of heart she mov'd  
on then to another,  
Stern and strong in his death. "And dost  
thou suffer, my brother?"

Holding his hand in hers:—"Out of the  
Piedmont lion  
Cometh the sweetness of freedom! sweetest  
to live or to die on."

Holding his cold rough hands,—“Well, oh,  
we'll have ye done  
In noble, noble Piedmont, who would not be  
noble alone.”

Back he fell while she spoke. She rose to her  
feet with a spring,—  
“That was a Piedmontese! and this is the  
Court of the King.”

### THE LOST LEADER

In the “Lost Leader” Robert Browning shows that the  
man who relinquishes an ideal suffers, not the ideal itself.

JUST for a handful of silver he left us,  
Just for a ribbon to stick on his coat—  
Found the one gift of which fortune bereft us,  
Lost all the others she lets us devote;

They, with the gold to give, do'd him out  
silver,

So much was theirs who so little allow'd,  
How all our copper had gone for his service!  
Rags—were they purple, his heart had  
been proud;

We that had lov'd him so, follow'd him,  
honor'd him,

Liv'd in his mild and magnificent eye,  
Learn'd his great language, caught his clear  
accents,

Made him our pattern to live and to die!  
Shakespeare was of us, Milton was for us,  
Burns, Shelley, were with us,—they watch  
from their graves!

He alone breaks from the van and the free-  
man,

He alone sinks to the rear and the slaves!

We shall march prospering,—not thro' his  
presence;

Songs may inspirit us,—not from his lyre;  
Deeds will be done,—while he boasts his  
quiescence,

Still bidding crouch whom the rest bade  
aspire.

Blot out his name, then, record one lost soul  
more,

One task more declin'd, one more footpath  
untrod,

One more devil's-triumph and sorrow for  
angels,

One wrong more to man, one more insult  
to God!

Life's night begins: let him never come back  
to us!

There would be doubt, hesitation, and  
pain,

Forced praise on our part—the glimmer of  
twilight,

Never glad confident morn'ing again!

Best fight on well, for we taught him—strike  
gallantly,

Menace our heart, ere we master his  
own;

Then let him receive the new knowledge and  
wait us,

Pardon'd in heaven, the first by the  
throne!

### THE CIRCLE

An old rhyme whose truth is being dramatically illus-  
trated in these dark days of war. The writer is unknown.

WAR begets Poverty,

Poverty Peace:

Peace begets Plenty,

Then riches increase:

Riches bring Pride,

And Pride is War's ground,

War begets Poverty,

So goes the round

### ALAS! HOW LIGHT A CAUSE MAY MOVE

Thomas Moore who wrote the following verses was an Irish  
poet and singer and had great popularity in his own time.

ALAS! how light a cause may move  
Dissension between hearts that love!  
Hearts that the world in vain had tried;  
And sorrow but more closely tied,  
That stood the storm when waves were  
rough,

Yet in a sunny hour fall off,  
Like ships that have gone down at sea,  
When heaven was all tranquillity!  
A something light as air,—a look,  
A word unkind or wrongly taken,—  
Oh! love that tempests never shook,

A breath, a touch like this hath shaken!  
And ruder words will soon rush in  
To spread the breach that words begin;  
And eyes forget the gentle ray  
They wore in courtship's smiling day;  
And voices lose their tone that shed  
A tenderness round all they said;  
I'll fast declining, one by one,  
The sweetnesses of love are, one,  
And hearts, so lately mingled, seem  
Like broken clouds,—or like the stream  
That smiling left the mountain's brow,  
As though its waters ne'er could sever,  
Yet, ere it reach the plain below,  
Breaks into floods that part for ever.

O you, that have charge of Love  
Keep him in rosy bondage bound,  
As in the fields of bliss above  
He sits, with flowerets fettered round;—  
Loose not a tie that round him clings  
Nor ever let him loose his wings;  
For even an hour, a minute's flight  
Will rob the plumes of half their light  
Like that celestial bird,—whose nest  
Is found beneath far eastern skies,—  
Whose wings, though radiant when at rest,—  
Lose all their glory when he flies!

## LOVE, DEATH, AND REPUTATION

This little fable appears in a collection of Charles and Mary Lamb's verses for children. It is probably by Charles Lamb, and is a poetic translation of a fable told in an old play of Queen Elizabeth's time. Its lesson is one of the most important we can learn—never to lose our good reputation.

ONCE on a time, Love, Death, and Reputation,

Three travelers, a tour together went;  
And, after many a long perambulation,  
Agreed to part by mutual consent.

Death said: "My fellow tourists, I am going  
To seek for harvests in th' embattled  
plain,  
Where drums are beating, and loud trumpets  
blowing,  
There you'll be sure to meet with me again."

Love said: "My friends, I mean to spend  
my leisure  
With some young couple, fresh in Hymen's  
bands;  
Or 'mongst relations who, in equal measure,  
Have had bequeathed to them house or lands."

But Reputation said: "If once we sever,  
Our chance of future meeting is but vain;  
Who parts from me must look to part for  
ever  
For Reputation lost comes not again"

## SONNET

In this sonnet Wordsworth gave voice to discontent with his own age that—to his mind—was given up to material things.

THIS world is too much with us: late and  
soon,  
Cutting and spending, we lay waste our  
powers;

Little we see of nature that is ours;  
We have given our hearts away,—a sordid  
boon!

This sea that bares her bosom to the moon, -  
The winds that will be howling at all hours,  
And are upgathered now like sleeping  
flowers,—

For this, for everything, we are out of tune,  
It moves us not. Great God! I'd rather be  
A Pagan, suckled in a creed outworn:  
So might I, standing on this pleasant lea,  
Have glimpses that would make me less  
forlorn;

Have sight of Proteus rising from the sea,  
Or hear old Triton blow his wreathed horn

## MEMORIES

Longfellow, in the following poem, points out that beautiful things and pleasant things never die, for their roots endure.

OF I remember those whom I have  
known

In other days, to whom my heart was led  
As by a magnet, and who are not dead,  
But absent, and their memories overgrown  
With other thoughts and troubles of my own  
As graves with grasses are, and at their head  
The stone with moss and lichens so o'er-  
spread,

Nothing is legible but the name alone

And is it so with them? After long years,  
Do they remember me in the same way,  
And is memory pleasant as to me?  
I fear to ask; yet wherefore are my fears?  
Pleasures, like flowers, may wither and decay,  
And yet the root perennial may be.

## TO THOMAS MOORE

In this pledge to Thomas Moore it appears as though Lord Byron were thinking as much of himself as of his friend.

MY boat is on the shore,  
And my bark is on the sea;  
But, before I go, Tom Moore,  
Here's a double health to thee!

Here's a sigh to those who love me,  
And a smile to those who hate,  
And, whatever sky's above me,  
Here's a heart for every fate.

Though the ocean roar around me,  
Yet it still shall bear me on:  
Though a desert should surround me,  
It hath springs that may be won.

Were't the last drop in the well,  
As I gasped upon the brink,  
Ere my fainting spirit fell,  
'Tis to thee that I would drink

With that water, as this wine,  
The libation I would pour  
Should be—Peace with thine and mine,  
And a health to thee, Tom Moore

## SELECTIONS FROM "IN MEMORIAM"

THE path by which we twain did go,  
Which led by tracts that pleased us well,  
Thro' four sweet years arose and fell,  
From flower to flower, from snow to snow:

And we with singing cheer'd the way,  
And, crown'd with all the season lent,  
From April on to April went,  
And glad at heart from May to May

When each by turn was guide to each,  
And Fancy light from Fancy caught,  
And Thought leapt out to wed with  
Thought  
Ere Thought could wed itself with Speech.

## LOVE SERVICEABLE

HE does not rightly love himself  
Who does not love another more.  
COVENTRY PATMORE.

## THE THRESHOLD

This charming verse expresses the desire, common to us all, to remain akin to childhood, in spite of lengthening years.

LIFE lies before me, but shut is the door  
On all my childish days No more, no  
more  
Shall I in all my years again be free  
And careless - happy as I used to be.  
So be it, Lord! I know that all is right;  
I would not alter it or shirk the fight  
Shut then the door!—but leave a little crack.  
That when I meet a child I may slip back!

# THE AUTHOR'S RESOLUTION IN A SONNET

George Wither was an English poet who reflects the spirit of the Cavalier or Royalist party although he fought for Parliament against the king, raising a troop of horse with money from the sale of his estates. His verse is very musical and highly polished.

SHALL I, wasting in despair  
Dye, because a woman's fair?  
Or make pale my cheeks with care  
Cause anothers Roste are?  
Be she fairer than the Day  
Or the flowry Meads in May,  
If she thinks not well of me,  
What care I how faire she be?

Shall my seely heart be pin'd  
Cause I see a woman kind?  
Or a well disposed Nature  
Joyned with a lovely feature?  
Be she Meeker, Kinder than  
Turtle-dove or Pellican.  
If she be not so to me,  
What care I how kind she be?

Shall a woman's Vertues move  
Me to perish for her Love?  
Or her wel deservings knowne  
Make me quite forget mine own?  
Be she with that Goodness blest  
Which may merit name of best:  
If she be not so to me,  
What care I how Good she be?

Cause her Fortune seems too nigh  
Shall I play the fool and die?  
She that beares a Noble mind,  
If not outward helps she find,  
Thinks what with them he wold do,  
That without them dares her woe  
And unlesse that Minde I see,  
What care I how great she be?

Great, or Good, or Kind, or Faire  
I will ne're the more despair.  
If she loves me (this beleve)  
I will Die ere she shall grive  
If she slight men when I woe,  
I can scorne and let her goe,  
For if she be not for me,  
What care I for whom she be?

## ORSAMES' SONG

We have very little of Sir John Suckling's verse that has been preserved. He was a courtier, gay and careless in his living, yet withal possessed of a wit so polished and an ear so fine that each fragment is a little jewel.

WHY so pale and wan, fond lover?  
Prithee, why so pale?  
Will, when looking well can't move her,  
Looking ill prevail?  
Prithee, why so pale?

Why so dull and mute, young sinner?  
Prithee, why so mute?  
Will, when speaking well can't win her,  
Saying nothing do't?  
Prithee, why so mute?

Quit, quit, for shame this will not move.  
This cannot take her  
If of herself she will not love,  
Nothing can make her  
The devil take her!

# TO LUCASTA, ON GOING TO THE WARS

These verses of Richard Lovelace are justly famed for the last couplet, which is so often quoted.

TELL me not, sweet, I am unkind,  
That from the nunnery  
Of thy chaste breast and quiet mind  
To war and arms I fly.

True, a new mistress now I chase,  
The first foe in the field,  
And with a stronger faith embrace  
A sword, a horse, a shield

Yet this inconstancy is such  
As you, too, shall adore,—  
I could not love thee, dear, so much,  
Loved I not honor more

## NIGHT

William Blake's verse is very musical and simple. We meet his animals and angels very often.

THE sun descending in the west,  
The evening star does shine,  
The birds are silent in their nest,  
And I must seek for mine  
The moon, like a flower  
In heaven's high bower,  
With silent delight,  
Sits and smiles on the night

Farewell, green fields and happy grove,  
Where flocks have ta'en delight,  
Where lambs have nibbled, silent move  
The feet of angels bright;  
Unseen, they pour blessing,  
And joy without ceasing,  
On each bud and blossom,  
And each sleeping bosom

They look in every thoughtless nest,  
Where birds are covered warm,  
They visit caves of every beast,  
To keep them all from harm  
If they see any weeping  
That should have been sleeping,  
They pour sleep on their head,  
And sit down by their bed

When wolves and tigers howl for prey  
They pitying stand and weep,  
Seeking to drive their thirst away,  
And keep them from the sheep  
But if they rush dreadful,  
The angels, most heedful,  
Receive each mild spirit,  
New worlds to inherit

And there the lion's ruddy eyes  
Shall flow with tears of gold.  
And pitying the tender cries,  
And walking round the fold  
Saying: "Wrath by His meekness,  
And by His health, sickness,  
Are driven away  
From our immortal day.

"And now beside thee, bleating lamb,  
I can lie down and sleep,  
Or think on Him who bore thy name,  
Graze after thee, and weep  
For wash'd in life's river,  
My bright mane forever  
Shall shine like the gold,  
As I guard o'er the fold"

### ON HIS BLINDNESS

In his forty-fourth year, Milton whose sight had been failing for ten years, became totally blind. Yet in spite of this he wrote steadily until his death twenty-two years later.

WHEN I consider how my light is spent  
Ere half my days in this dark world  
and wide,  
And that one talent, which is death to hide,  
Lodged with me useless, though my soul more  
bent  
To serve therewith my Maker, and present  
My true account, lest He returning chide ; "  
"Doth God exact day-labor, light denied ? "  
I fondly ask ; but Patience, to prevent  
That murmur, soon replied : "God doth not  
need  
Either man's work or His own gifts ; who best  
Bear His mild yoke, they serve Him best ,  
His state  
Is kingly ; thousands at His bidding speed,  
And post o'er land and ocean without rest .  
They also serve who only stand and wait "

### THE RECONCILIATION

This beautiful little poem is one of the many lovely songs that occur in "The Princess" written by Alfred, Lord Tennyson

AS through the land at eve we went,  
And plucked the ripened ears,  
We fell out, my wife and I,—  
Oh, we fell out, I know not why,  
And kissed again with tears.

For when we came where lies the child  
We lost in other years,  
There above the little grave,  
Oh, there above the little grave,  
We kissed again with tears.

### OLD FRIENDS

WE just shake hands at meeting  
With many that come nigh,  
We nod the head in greeting  
To many that go by  
But we welcome through the gateway  
Our few old friends and true ;  
Then hearts leap up and straightway  
There's open house for you,  
Old friends,  
Wide open house for you.

The surface will be sparkling,  
Let but a sunbeam shine,  
But in the deep lies darkling  
The true life of the wine  
The froth is for the many,  
The wine is for the few ;  
Unseen, untouched of any,  
We keep the best for you,  
Old friends,  
The very best for you

"The many " cannot know us,  
They only pace the strand  
Where at our worst we show us,  
The waters thick with sand ,  
But out beyond the leaping  
Dim surge "'tis clear and blue,"  
And there, old friends, we're keeping  
A waiting calm for you.  
Old friends,  
A sacred calm for you

### BELIEVE ME, IF ALL THOSE ENDEARING YOUNG CHARMS

This is one of the most popular of Thomas Moore's songs and its musical setting is known to the majority of us.

BELIEVE me, if all those endearing young  
charms  
Which I gaze on so fondly to-day,  
Were to change by to-morrow, and fleet in my  
arms,  
Like fairy-gifts fading away,  
Thou would'st still be ador'd, as this moment  
thou art,  
Let thy loveliness fade as it will,  
And around the dear ruin each wish of my  
heart  
Would entwine itself verdantly still.

It is not while beauty and youth are thine  
own,  
And thy cheeks unprofan'd by a tear,  
That the fervor and faith of a soul can be  
known,  
To which time will but make thee more  
dear ;  
No, the heart that has truly lov'd never  
forgets,  
But as truly loves on to the close  
As the sun-flower turns on her god, when he  
sets,  
The same look which she turn'd when he  
rose.

### THE NIGHT HAS A THOUSAND EYES

THE night has a thousand eyes  
And the day but one,  
Yet the light of the bright world dies  
With the dying sun

The mind has a thousand eyes,  
And the heart but one ,  
Yet the light of a whole life dies  
When love is done

### FROM " IN MEMORIAM "

OUR little systems have their day ,  
They have their day and cease to be  
They are but broken lights of Thee.  
And Thou, O Lord, art more than they

Forgive my grief for one removed  
Thy creature, whom I found so fair,  
I trust he lives in Thee, and there  
I find him worthier to be loved

I sometimes hold it half a sin  
To put in words the grief I feel ;  
For words, like Nature, half reveal  
And half conceal the soul within.

### WINTER

This charming stanza is by Walter Savage Landor.

SUMMER has doft his latest green,  
And Autumn ranged the barley-mows  
So long away then have you been ?  
And are you coming back to close  
The year ? It sadly wants repose

## THE OLD WOMAN AND HER PIG



AN old woman was sweeping her house, and she found a little crooked sixpence. "What," she said, "shall I do with this little sixpence? I shall go to market and buy a little pig." As she was coming home she came to a stile. The piggy would not go over the stile. She went a little farther, and she met a dog, so she

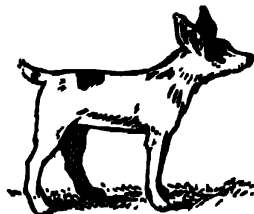


said to the dog:

"Dog, dog, bite pig,

Piggy won't get over the stile, And I sha'n't get home to-night!"

But the dog would not.



SHE went a little farther, and she met a stick. So she said:

"Stick, stick, beat dog;

Dog won't bite pig,

Piggy won't get over the stile,

And I sha'n't get home to-night!"

But the stick would not.



SHE went a little farther, and she met a fire. So she said:

"Fire, fire, burn stick;

Stick won't beat dog;

Dog won't bite pig;

Piggy won't get over the stile,

And I sha'n't get home to-night!"

But the fire would not.

SHE went a little farther, and she met some water. So she said:

"Water, water, quench fire;

Fire won't burn stick;

Stick won't beat dog;

Dog won't bite pig;

Piggy won't get over the stile,

And I sha'n't get home to-night!"

But the water would not.



SHE went a little farther, and she met an ox.

So she said:

"Ox, ox, drink water;

Water won't quench fire;

Fire won't burn stick;

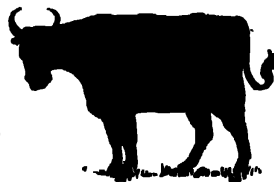
Stick won't beat dog;

Dog won't bite pig;

Piggy won't get over the stile,

And I sha'n't get home to-night!"

But the ox would not.



SHE went a little farther, and she met a butcher.

So she said:

"Butcher, butcher, kill ox;

Ox won't drink water;

Water won't quench fire;

Fire won't burn stick;

Stick won't beat dog;

Dog won't bite pig;

Piggy won't get over the stile,

And I sha'n't get home to-night!"

But the butcher would not.



SHE went a little farther, and met a rope. So she said:

"Rope, rope, hang butcher;

Butcher won't kill ox;

Ox won't drink water;

Water won't quench fire;

Fire won't burn stick;

Stick won't beat dog;

Dog won't bite pig;

Piggy won't get over the stile,

And I sha'n't get home to-night!"

But the rope would not.



SHE went a little farther, and she met  
a rat. So she said :



" Rat, rat, gnaw rope ;  
Rope won't hang  
butcher ;  
Butcher won't kill  
ox ;  
Ox won't drink water ;  
Water won't quench  
fire ;  
Fire won't burn stick ;  
Stick won't beat dog ;  
Dog won't bite pig ;  
Piggy won't get over the stile,  
And I sha'n't get home to-night ! "

But the rat would not.

SHE went a little farther, and she met  
a cat, so she said :



" Cat, cat, kill rat ;  
Rat won't gnaw rope ;  
Rope won't hang butcher ;  
Butcher won't kill ox ;  
Ox won't drink water ;  
Water won't quench fire ;  
Fire won't burn stick ;  
Stick won't beat dog ;  
Dog won't bite pig ;  
Piggy won't get over the stile,  
And I sha'n't get home to-night ! "

BUT the cat said to her, " If you will  
go to yonder cow, and fetch me a  
saucer of milk, I will kill the rat." So  
away went the old woman to the cow,  
and said .

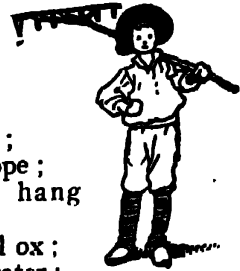


" Cow, cow, give me a  
saucer of milk ;  
Cat won't kill rat ;  
Rat won't gnaw rope ;  
Rope won't hang butcher ,  
Butcher won't kill ox ;  
Ox won't drink water ;

Water won't quench fire ;  
Fire won't burn stick ;  
Stick won't beat dog ;  
Dog won't bite pig ;  
Piggy won't get over the stile,  
And I sha'n't get home to-night ! "

BUT the cow said to her, " If you  
will go to yonder haymakers, and  
fetch me a wisp of hay, I'll give you  
the milk." So away went the old  
woman to the haymakers, and said :

" Haymakers,  
give me a  
wisp of hay ;  
Cow won't give  
milk ;  
Cat won't kill rat ;  
Rat won't gnaw rope ;  
Rope won't hang  
butcher ;  
Butcher won't kill ox ;  
Ox won't drink water ;  
Water won't quench fire ;  
Fire won't burn stick ;  
Stick won't beat dog ;  
Dog won't bite pig ;  
Piggy won't get over the stile,  
And I sha'n't get home to-night ! "



BUT the haymakers said to her, " If  
you will go to yonder stream, and  
fetch us a bucket of water, we'll give  
you the hay." So away  
the old woman went.  
But when she got to the  
stream, she found the  
bucket was full of holes.



So she covered the  
bottom with pebbles and  
then filled the bucket  
with water, and she went  
back with it to the hay-  
makers, and they gave her a wisp of  
hay. As soon as the cow had eaten  
the hay, she gave the old woman the  
milk ; and away she went with it in  
a saucer to the cat. As soon as the cat  
had lapped up the milk :



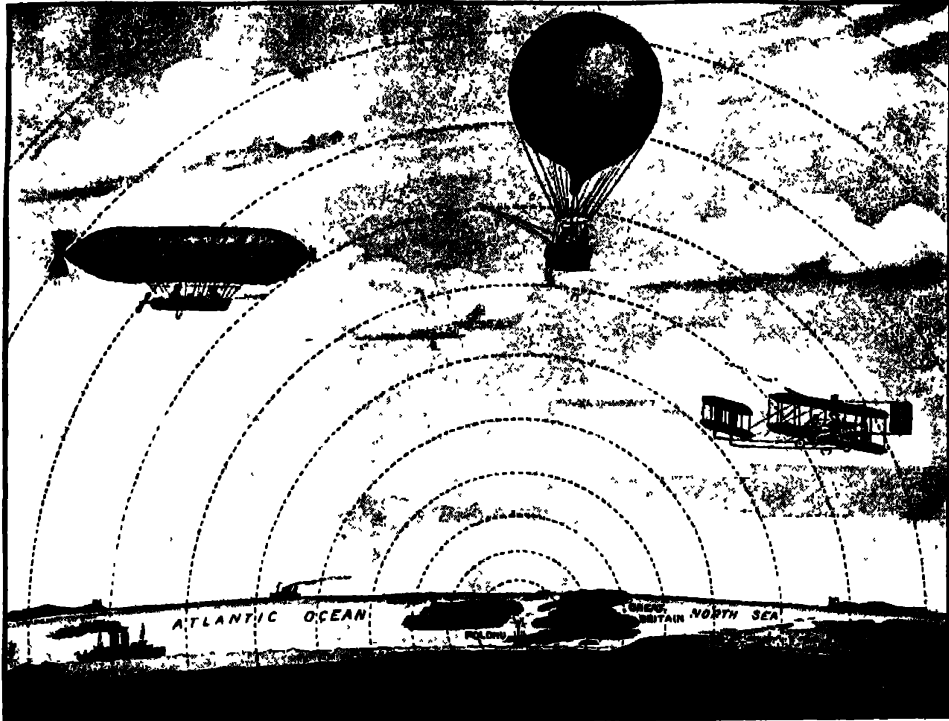
The cat began to kill the rat ;  
The rat began to gnaw the rope ;  
The rope began to hang the butcher ;  
The butcher began to kill the ox ;  
The ox began to drink the water ;  
The water began to quench the fire ;  
The fire began to burn the stick ;  
The stick began to beat the dog ;  
The dog began to bite the pig ;  
The little pig in a fright jumped over  
the stile ;

SO the old woman got home that  
night !



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## HOW WORD-WAVES TRAVEL EVERYWHERE



This picture shows us in a diagram the wonderful way in which the electric shocks travel through the ether. The wireless waves radiate in all directions, so that in less than one-sixtieth of a second a dot of the message, shown here as being sent from Poldhu, could be received in London, Norway, Berlin, America, or on any ship sailing on the Atlantic Ocean. It is to prevent everyone receiving everyone else's messages that the instruments are tuned. The message could also be received in airship, aeroplane, or balloon at thousands of miles above the clouds if men could get there. It is also believed that they descend into the earth.



This picture shows us, in another way, what we see above—how the wireless waves radiate, expanding evenly in true circles. The boy has thrown a stone into the river, and the waves flow outwards, getting fainter and fainter the farther they get from the spot where the shock occurred. The wireless waves are waves in the ether very like these water-waves, with this difference, that while the ripples of water travel only in a horizontal direction all round, and at a slow rate, the wireless waves travel at a very rapid pace, and in all directions. A better illustration of how these electric waves travel is provided by the light from a lamp or candle. The light-waves move from the flame in every direction, and the wireless waves travel through the world in exactly the same way from the centre at which the message is sent off.



## WHY THE WINDS BLOW THE GALES THAT SWEEP ACROSS THE SEA

WHEN we look at a weather-vane we can tell from what direction the wind is blowing. The revolving part of a weather-vane has much more surface at one side than it has at the other and the side with the bigger surface is blown away from the wind. Thus the smaller part is at the side from which the wind is coming. Arms are generally fixed to the stem of a weather-vane, and at the end of these arms are the letters N, S, E., W., indicating the four directions of north, south, east, and west. If the arrow of the vane or the head of the weather-cock points north, we know that the wind is blowing from that direction.

It is easy enough to read the weather-vane, and it will perhaps suggest a number of other interesting questions.

Why, for instance, does the wind blow at all? Why does it not always remain still, as it does sometimes in summer? Why does it sometimes blow gently, sometimes strongly, and sometimes rage in a hurricane? Why does it blow sometimes from the north, sometimes from the south, and sometimes from the east or west?

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Finally, why do some kinds of wind bring some kinds of weather, and other kinds of wind bring other kinds of weather?

The science of wind and weather is called *meteorology*. The word comes from two Greek words meaning "to raise beyond." The word *meteor* now means only a fragment from another world that comes flying into our atmosphere. But formerly meteor had a wider meaning. Anything connected with the atmosphere was called a meteor, and so the science of the weather became known as meteorology.

Now we come back to the first question: Why does the wind blow? For the same reason that smoke comes out of a chimney. That is a curious answer, but it is correct. The real cause of the wind is that air expands and rises as it becomes hotter. If we take an empty bottle, stop its mouth with a cork, and place it in front of the fire, either the cork will pop out or the bottle will burst. The air inside the bottle wants more room.

Now, the sun shines upon this world and heats the air in certain



parts. The warmed air, being lighter than cold air, rises; and cold air, being heavier than warm air, rushes in to fill up the place which the warmer air occupied before it began to rise. That is the reason why the wind blows, given as simply as it can be given.

Generally, a breeze from the sea begins to blow on to the land a few hours after the sun has risen. Again let us ask—why? Land becomes warmer than water under the heat of the sun, so the air on the land rises, and the cooler air from the sea blows in to take its place, only to be warmed in its turn, and to allow more cool air to blow in from the sea. When the sun has set, the land becomes cool more quickly than the sea, so that the air above the land is denser, or heavier, than the air above the sea, and the cooler land air blows out to sea to replace the warmer sea air that is rising because it is warmer.

#### WHY ARE SOME WINDS WARM AND SOME COLD?

Winds become like the surface of the earth over which they travel. A wind which blows over a hot, dry desert becomes hot and dry; a wind which blows over ice-fields and snow-clad mountain-tops becomes piercingly cold; a wind which blows from, or over, the sea is likely to bring rain.

Whatever wind may blow, it has its cause in the inequality of temperature and heaviness in the atmosphere. Nature strives for equality, and warm breezes and cold blasts are Nature's way of equalizing matters.

#### WHAT ARE THE TRADE WINDS?

The trade winds are so called because, in the days before steamships, these winds were really the "drivers" of the world's trade, being the only power which enabled the ships to travel along the great highways of the ocean. The trade winds are winds that are always blowing from the Poles towards the Equator. But in going towards the Equator the trade wind that comes from the Arctic regions does not blow directly south, and the trade wind that blows from the Antarctic regions does not blow directly north.

The reasons for this are interesting. The earth is always revolving, carrying the air along with it. Thus the air at the Poles is revolving with the earth and

at about the same rate as the parts of the earth near the Poles are revolving. As the winds proceed towards the Equator, they go always into parts of the world that move faster than the parts near the Poles, just as in top-spinning the widest part of the top moves more quickly than a spot nearer the centre.

The winds that have come from nearer the Poles do not at once acquire the faster speed, so that the earth beneath them revolves faster than they do, and therefore they come to be not north and south winds, but north-east and south-east winds. The trade winds are most pronounced in the Pacific and Atlantic Oceans, because there is almost no land surface to modify them in their passage.

#### WHAT IS A WHIRLWIND?

In some parts of our country the whirlwind or cyclone is much dreaded. The whirlwind is caused by winds coming from opposite directions at the same time. When such winds meet, they make a circular motion with great violence, and, being pressed on by more wind coming behind, may be driven upwards with such force that at sea they may lift a column of water with them, thereby making a waterspout.

At times terrible gales sweep the sea. Before the days of steamships, sailors used to look forward with dread to the autumnal gales. Often they would battle with the elements for days together.

The sails would be torn to shreds by the fury of the wind. The mighty, foaming seas would charge upon the ship like an invading host, throwing themselves with terrific force upon the decks, and sometimes carrying away the masts. The gales are not such a danger to shipping as they once were, for nowadays steamships are independent of the wind for their motive power, and so they plough their way doggedly through the boisterous sea until they reach the desired port.

#### WHAT IS A HURRICANE?

The word tornado means turning, and from this we may readily see that it is a kind of whirlwind. It is caused by the air becoming so hot that it rises with frightful rapidity. This causes a sort of vacuum which the air all round rushes in to fill. As the air is carried up it becomes cooler, expands, and forms a

cloud, which spreads itself outward in the sky so that the tornado looks like a huge funnel hanging from a heavy black cloud. The force of the mad dance of the currents as they meet carries the tornado onward, and its appearance as it whirls along its path of destruction is terrific. The motion of the currents usually commences close to the ground, but a tornado may be carried along some distance up in the air. The speed with which it moves is so great that it sweeps everything before it; but happily it takes a much narrower path than a whirlwind does, and as a rule it does not last long.

Tornadoes are most frequent in the Mississippi Valley and in the southern states.

### WHAT IS A CLOUD BURST?

A cloud burst is also caused by a whirlwind. Sometimes the currents of hot air which rush up from the surface of the earth are met in the upper regions by a current of cold air. When this happens the moisture which the hot current has carried up from the ground rapidly becomes condensed and falls to the earth again in a sudden deluge of rain. This is called a cloud burst.

### IS IMPURE AIR LIGHTER THAN PURE AIR?

We are prone to be misled on this point, for other things affect the weight of air besides the kind of stuff that is in it; and one of the most important of these things is its temperature. It is true that in a room or church or theatre the impure air is lighter than the pure air, and therefore it ascends. But though this is true, it is not true that impure air is lighter than pure air. The impure air made by human beings or animals, or by fires, gas-jets, lamps, or candles, is hot because it is made by the process of burning, whether inside our bodies or outside them, and that process produces heat. Now, the hotter the air is, the lighter it is.

But if we were to wait until this impure air had cooled we should find that the impure part of it was heavier than the air. The most important gas in impure air is carbon dioxide, and this is heavier than ordinary air of the same temperature. Thus, in caves and mines where carbon dioxide is formed, it always tends to lie as low as possible.

This is a fact which every miner knows; and it is a very interesting experiment to lower a lamp down an old mine, or a well, and find that when it has dropped a certain distance it goes out because it has reached the level of the carbon dioxide.

### DOES CHANGE GO ON IN OTHER WORLDS?

We know from our study of the surface of the earth that in the course of long ages it has changed very much. But men have been inclined to suppose that the skies do not show any change except in the position of the stars. However, when we study the sun and the planets by means of powerful telescopes, we find that all sorts of slow changes are going on in the heavenly bodies. Perhaps sun-spots need not be counted, as they come and go, and no one can say that there is any evidence of any changes in the sun going on steadily in one direction. But there is no doubt as to changes in at least two planets, Jupiter and Mars.

On the surface of Jupiter, the giant planet, there is a curious marking called the great red spot; and during the years that this has been watched it has certainly shown changes in shape and size and color. They are, indeed, much quicker than the changes on the earth that happen at the present time; but the surface of Jupiter is much hotter than the surface of the earth, which has mostly become set and rigid, while on Jupiter the surface is more fluid, and, indeed, so hot that it probably gives out some light of its own still. As for Mars, it shows many changes both in large features and in small. Considerable areas of Mars, which must once have been ocean-beds, are now certainly dry.

### WHY DOES YEAST MAKE BREAD RISE AND BISCUITS BUBBLE?

Yeast is a simple kind of living plant which produces a substance called a ferment, that has the power of causing certain chemical changes in sugar. When yeast is used to make bread, the results all follow from the fermentation of sugar. Sugar is an extremely complicated substance, containing three kinds of atoms—carbon, hydrogen, and oxygen. When it is fermented the sugar is partly burned—that is to say, the ferment takes a certain amount of oxygen from the air and adds it to the sugar, which is decomposed and turned

into something else. If anything made of carbon, hydrogen, and oxygen is completely burned, the result will be carbon dioxide from the burning of the carbon, and water from the burning of the hydrogen. In this case the burning is not complete, but still a good deal of carbon dioxide is formed, and this makes the bubbles which form in the dough, and cause it to rise. A good deal of it escapes into the air, but much is caught, and so the bread is made.

The other thing which results from the fermentation of the sugar is alcohol, which is also a compound, though a much simpler one, of carbon and hydrogen and oxygen. For this reason the process we have been describing is usually known as the alcoholic fermentation of sugar. Practically the whole of the alcohol flies away into the air and is lost.

#### WHAT IS THE DIFFERENCE BETWEEN A FRUIT AND A VEGETABLE?

In ordinary talk we usually make a distinction between fruit and vegetables, but most people could scarcely say what the difference really is. All living creatures are divided into two great classes, animal and vegetable, and every kind of fruit belongs to the class of vegetables.

Still, though an apple or a strawberry is just as much a vegetable as a cabbage or a potato, we can find a distinction between them. Indeed, students of plants use the word fruit in a definite way. Many kinds of plants do not produce a fruit at all, but all the higher plants do, even including the greatest trees. The fruit of a plant is that part of it which contains the seed. Indeed, the fruit and the plant exist in order to produce the seed; when we study the history of the fruit we find that it always comes from the flower. The purpose of the flower is to form the seed; and then the flower disappears and we have, instead, the fruit, which holds the seed for its destiny.

Thus some of the things that we usually call "vegetables," such as tomatoes and cucumbers, are fruits in the proper sense of the word, because they bear the seed.

#### COULD A MACHINE GO ON FOR EVER?

This is a new way of asking the old question whether men can find what is called "perpetual motion," though that

phrase is not good to express what is meant. The whole universe is a perpetual-motion machine. Formerly many men thought they saw signs that the universe is running down, like a clock that was once wound up, and that in time all motion will end. But men see now that when motion disappears it has been turned into something else, and that the motion can be got out of it again. Therefore we believe that all motion is perpetual, for motion is a kind of power and no power is ever lost, though it may be changed.

When we say that perpetual motion is impossible, we mean something very different. We mean that we cannot get work from power and still have the power which did the work for us. It is never possible to get something for nothing. If a spring is to drive a clock it must become less tight, and then it will need winding again. The power put into it when the clock was wound has gone in the motion of the clock, and perpetual motion is impossible, in the sense that we cannot spend power of any kind and at the same time keep it.

#### WHAT IS GREEDINESS?

People often say that children are greedy, and should be ashamed of themselves. Now, children, and grown-up people too, may often be very hungry, and then will eat a great deal and perhaps very quickly. The question is whether there is any difference between being greedy and being very hungry. There is a difference, and a very real one. When we see anyone eating dry bread, however much or ravenously he eats, we do not say that he is greedy. We simply say that he must have been starved, and is very hungry.

We say that a child is greedy when he wants to go on eating, not because he is hungry, but because he likes the taste of highly flavored food like cake and rich Christmas pudding and candy. This is not hunger at all, for a child or a grown-up person may greedily eat far too much of such things just after a good meal.

This is really the craving of the nerves of taste, and is an utterly different thing from hunger. We are right to call it greed, and to regard it as unworthy. Some grown-up people are often just as greedy as children, though usually not so

much for sweets as for other highly flavored foods.

# **WHAT WOULD HAPPEN TO A PENNY IF IT GOT BEYOND THE PULL OF THE EARTH?**

The law of gravitation states that every portion of matter throughout the universe attracts every other portion of matter. Therefore, however far a penny might go in any direction, it could never be beyond "the pull of gravitation." Wherever it was, it would be attracting, and attracted by, all other matter in the universe, including the matter that forms the earth. But a penny might be imagined as going so far that the force of the earth's gravitation might not succeed in pulling it back again, because the attraction of some other body might be more powerful. If there were no other heavenly bodies, gravitation would, of course, bring the penny back to the earth.

Where the penny would go would depend on its direction. It might be drawn into the moon. If it passed farther away it might be drawn into the sun, or into Jupiter. But sooner or later it would almost certainly pass near some large heavenly body, and be drawn into it. Its actual fate would depend on the force with which it left the earth, for if this were just right, the penny might travel round the earth as the moon does, or form a new planet revolving round the sun.

# **WHY DOES THE COLOR RUSH FROM THE FACE WHEN WE ARE FRIGHTENED?**

Plainly the reason why the face of a frightened person is likely to turn pale must be found in the circulation of the blood, which usually gives the face its color. If at such a moment we had our finger on the large artery which beats at the wrist, and is generally called the pulse, we should notice that the beats had suddenly become few and irregular. It is the heart that is beating too slowly, not strongly enough to force the blood along the arteries to the skin.

We may wonder how fear can actually reach the heart and affect its action. The answer is, that there runs down the neck, on each side, from the brain to the heart, a remarkable nerve, called the *vagus*, or wanderer, because it goes to so many distant places, and one of its duties is to run to the heart and carry orders from the brain. When we turn

pale from fear, what has happened is that the brain has sent powerful orders through the vagus nerve to the heart, nearly making it stop beating altogether.

# **WHAT MAKES PEOPLE FAINT?**

When a person who has been standing up suddenly turns pale, sways, and falls to the ground, it is plain that something has happened to stop the working of his brain. Perhaps we forget that our brain must be working all the time, and that if it stopped for a moment we should certainly topple over. That is what happens when a person faints; the brain-centres which control the balance of the body, and those which give orders to the muscles of the legs, cease to act.

We can guess the reason of this if we remember that the face of a fainting person is always pale. This gives us the hint that the supply of blood to the head is defective. The heart is not sending enough blood upwards, and so not only the face but the brain becomes pale and ceases to work. All nerve-cells require a continuous supply of blood, or they will cease to work. There is no other kind of cell that so quickly exhausts its nourishment.

We may go farther back and ask why the heart is not sending enough blood to the head. Many reasons are possible. Too much blood, for instance, may be going elsewhere, the heart may be weak or poisoned by our breathing foul air, or the blood may be too poor in quality to do its work properly.

# **WHERE DOES OUR WARMTH COME FROM?**

As we talk of warm clothing we might think that our warmth came from our clothes; but, if we think a little, we shall agree that our clothes, at most, can only keep in the warmth, which comes from somewhere else. Sometimes, it is true, our bodies get warmth from something outside of them, from the sun, or a fire, or in a hot bath. But we should be very badly off if we had nothing else to depend on for keeping up the heat of our bodies.

We make our warmth ourselves, and it all comes from our food. Almost everything we need as food can be burned if it is dried, and, though it is certainly not dried in the body, it can

be burned there. The foods which burn best outside the body are those which furnish most of our warmth inside it. Such foods are fats and oils, sugar and starch. If necessary, our warmth can be got from the burning, inside the body, of such foods as meat and white of egg; but this is a very wasteful way of getting it, and, indeed, the reason why we take such foods as fat and sugar is to save the others and to supply the warmth of the body in the safest way.

Of course, all burning requires oxygen, and half the credit of producing our warmth belongs to the air we breathe.

### WHAT MAKES THE NEW ELECTRIC LAMPS SO BRIGHT?

During the last few years the small electric lamps used in houses have become much brighter without costing more for the electricity that we use. This is because a new kind of material has been employed in making them. In all incandescent electric lamps, the principle is to send an electric current along a very thin wire which is kept away from the air. The wire is so thin that it offers great resistance to the flow of the electricity, much of which is turned into heat, and makes the wire glow. If the wire were exposed to air it would quickly burn away, but the lamp is carefully made so as to contain practically no air. If the glass is broken the wire burns and snaps in a moment.

The brightness of the light depends largely upon the particular material of which the wire is made. The feature of the new lamps, now so much used, is that, instead of having a carbon wire, they have a wire made of one or other of three rare metals, named *osmium*, *tantalum*, and *tungsten*. The last appears most satisfactory, but the wires are very fragile and often break. This difficulty will, no doubt, be overcome.

### ARE HIGH HEELS HARMFUL?

No doubt many people wear high heels to their boots and shoes without much harm. The human foot is beautifully made for its purpose. It has a wonderful arch, which is elastic, and can give a little, and then rebound when pressure is placed upon it. This gives the spring and grace to the walk of people whose feet are in good order. But when people wear high heels they

alter the line down which the weight of the body passes through the foot to the ground. Instead of passing down behind the arch of the foot, it passes through that arch, so that people who wear high heels cannot walk naturally, and tire of walking much sooner than they otherwise would.

It is believed that, in some cases, people may hurt their brain and nerves by wearing high heels, for every step means much more of a jar to the body than if the shock were taken up by the spring of the foot. Then, again, people who wear high heels, and throw the weight of the body too far forward along the foot, are likely to have corns and ingrowing toe-nails, and to get the joints of some of the toes made very stiff.

### DOES A FISH DRINK?

If any living thing is completely dried, it either dies or else it stops living until it gets water again. All living things must drink in one way or another. We know, also, that the water taken in is quickly spoiled, and a fresh supply must be had; a man may go without food for forty days, but he cannot go without water for ten.

Fishes drink, and fishes that live in salt water must drink salt water. But we must not suppose that fishes are drinking when we watch them in an aquarium and they look almost as if they were gulping the water. Fishes require not only to drink but also to breathe, and as they live under water they must breathe by means of the oxygen which is dissolved in the water in which they live.

When we watch them they are breathing by passing water through their gills, which serve them for lungs. The water that passes through their gills yields up to their blood the oxygen they want, but this water is not drunk. When a fish drinks it takes water in by its mouth as we do.

### WHAT DOES SOWING WILD OATS MEAN?

In Denmark in the north of Europe, the Danes call the heavy vapors which steam from the earth just before the season of vegetation Loki's Wild Oats; when the fine weather comes they say: "Loki has sown his wild oats." Loki is the evil being of the North.

## THE BOOK OF WONDER

We might ask ourselves if this is the origin of the phrase about a foolish and extravagant young man "sowing his wild oats." Perhaps it is; but there is something very interesting to be learned about real wild oats. It is said that if we take a head of these wild oats in a moistened state, and lay it carefully on a table, the next morning we shall find that it has moved some distance away. It is like a rolling stone.

The spike or these oats is exceedingly hard, and does not "give," like the ordinary spike of oats and barley; and so it comes about that the weight of the ears overbalances these sharp-pointed spikes, and the head of grain goes tumbling and rolling over and over, like a stupid young man who cannot settle down to good steady work.

### DO OUR EYES MAGNIFY?

The real meaning of the word magnify is to make larger, and if we remember this, we must see at once that our eyes do not magnify. When we look up and see the sun or moon or a star, we are looking at a thing so huge that our bodies are nothing at all compared with it, and the image of that thing upon the curtain at the back of our eyes is tiny compared with our bodies.

If we think of an eye, and the size of it, and then think of the fullest possible extent of the curtain at the back of it, we shall understand that, of course, our eyes do not magnify. A thing magnifies when it makes the image of an object larger than that object itself. A microscope does that. It may take a thing so tiny that our eyes unaided cannot see it, and yet throw on our eyes an image as large as that thrown by the sun when we look up into the sky. In such a case it is not our eyes which have done the magnifying.

Many insects have eyes which are of a quite different pattern from our eyes, and which look as if they must really magnify. If they are to do so, they must be used as a microscope is, with the lens—whether a piece of a glass or a part of a living eye—extremely close to the object that is to be looked at. If we use our own eyes for objects placed so near as that, we cannot see anything at all, for our eyes are not made for that kind of vision, but are

really meant for use at considerable distances. That is the use which tires them least.

### WHAT ARE SUN-SPOTS?

Sun-spots were first seen by Galileo, in 1609, over 300 years ago. These dark spots have now been examined not only by huge telescopes, but also by having the light from them studied separately in other ways. An American astronomer has found what sun-spots are.

They are a sort of magnetic storm in the gases that make the atmosphere of the sun. Those in half of the sun always twist in the opposite direction from those in the other half—as is the case also with movements of the air upon the earth.

The light from sun-spots, when examined, is found to have been affected by a special kind of force called magnetism; and that is one reason why we know that sun-spots are really a sort of magnetic storm of a special kind in the sun's atmosphere.

Magnets on the earth are affected by sun-spots; and it may be that there is also a close connection between sun-spots and our weather—or, perhaps, not so much the weather as it is from day to day, as the climate over several years. We know that sun-spots regularly increase and decrease in number every eleven years.

But we must not say that the sun-spots move the magnetic needles on the earth, or change the weather. Whatever is the cause of sun-spots—perhaps something not in the sun at all—causes at the same time sun-spots on the sun and magnetic disturbances on the earth.

### WHY DOES ELASTIC STRETCH?

We know that many kinds of material made by living beings have properties which are not found anywhere else. The secret must lie in the way in which the little molecules, as they are called, that make up the elastic are connected. All we know as yet is that, for molecules, they are very large and complicated, and are probably linked together in a very complicated way. We must distinguish between the stretching of a thing like elastic, which flies back, and the stretching of, say, putty, which never flies back.

**WHY SHOULD A METAL COFFEE-POT BE BRIGHTLY POLISHED?**

An efficient housewife wishes to serve her guests with hot instead of cold coffee. The metal of a coffee-pot is a good conductor of heat and is of the same temperature as the coffee. If the heat is radiated as fast as it is conducted by the metal, the coffee infusion will lose heat rapidly to supply the metal with heat to take the place of the radiated heat. A rough surface is made up of countless microscopical valleys and hills whose total surface is from two to five times as large as the surface which has had its little hills broken off by rubbing and its valleys made less in number. A small surface radiates less than a large surface by just as much as it is smaller than the large surface. It is not possible, by paint or stain of any kind, to make the surface of a coffee-pot as small as if polished by the use of good muscular rubbing. Test this by placing on a table a smooth-surfaced pot of boiling water at a distance of about four inches from a thermometer, and repeat the experiment with a rough-surfaced pot. You will notice a marked difference in the action of the thermometer.

**WHAT DO WE MEAN WHEN WE SPEAK OF A CALORIE?**

If a person wishes good health, his food supply is one of the few things demanding constant attention. If one eats to simply satisfy his appetite, he makes an error. It is now well known that the human body calls for heat and for constructive material—iron, sulphur, carbon, phosphorus, etc. One may eat so as to obtain much heat and little constructive material; or he may obtain much of the latter and little of the former. The heat from food needed by the body is spoken of as 2,000 calories each day. Now a calorie is the heat required to raise the temperature of one gram of water one degree centigrade. We get an idea of the meaning of this expression if we learn from books that a calorie, when put to work, can lift one *pound* of matter to a height of 40.4 inches. Therefore 2,000 calories can lift one *ton* of matter to the same height. In other words, our heat requirement per day *must* be sufficient to enable us to do the equivalent of the work just mentioned. It is needless to mention that we use that amount of heat unconsciously. We should never eat more than we need, for the effect is much the same as would

be produced by putting too much coal in the furnace.

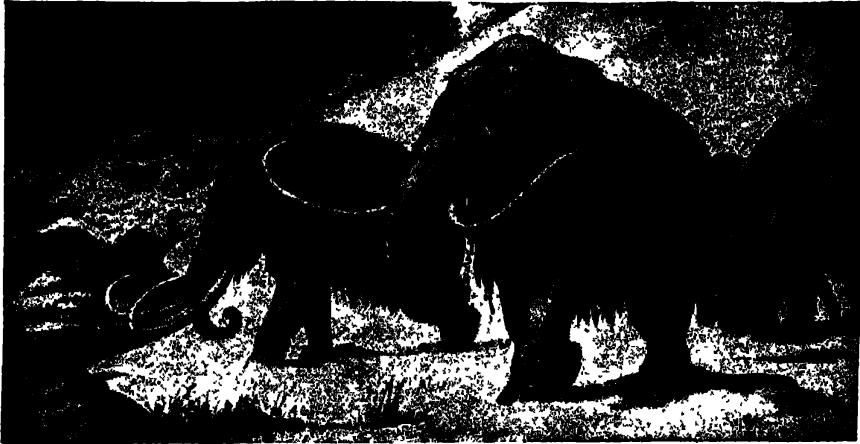
**WHAT IS A BOND, AND WHY ARE BONDS NEEDED?**

A bond really means the same thing as a band—something that binds or ties. When we speak of a bond, we mean that a man binds himself by a written promise to pay a certain sum of money. For instance, a man gives a bond that he will do his duty faithfully in a position of trust, such as that of a bank manager. Two of his friends, or a company, go surety for him, which means that if he should be tempted and do wrong the sureties will pay the bank a sum of money for which they have given security. If a man is accused of wrong-doing, he is often allowed his freedom, until his trial, if some one gives a bond that he will appear when called on.

The form of bond, however, of which you are probably thinking is such a bond as a railway company, or a gas company, or a town or city might give. When a city or town wishes to make improvements in the streets, or to erect new buildings, or if a company is about to build a new railway line or has to build a manufacturing plant, it issues bonds, that is, it sells its promises to pay back the money at the end of a certain number of years, and in the meantime to pay interest. These promises to pay are for a fixed amount of money, perhaps a hundred dollars, or a thousand, or five thousand dollars. The bond itself is a sheet of paper on which is printed or engraved the agreement about rate of interest, time of payment, and the like. Generally a number of coupons are printed on the sheet or attached to it. The coupon tells how much interest will be due on a date on which the bond promised that interest should be paid. Usually there is a coupon for every six months. If a company can not pay its debts, its property is sold and the bondholders are paid.

The nation sometimes borrows money on bonds. When we bought Liberty Bonds, for instance, it meant that we were lending money to the government, and in return we got a promise or pledge that the country would pay back the money at a stated time. The War Savings Stamp is a sort of baby bond, but interest on it is not paid until the government pays back the money spent for the stamp.

THE NEXT QUESTIONS ARE ON PAGE 621.



Mammoths of the Glacial Age.

## UNKNOWN ANIMALS

UNDER the lens of a powerful microscope a drop of water is seen to be teeming with living things. To the tiny creatures in it that drop of water is as an ocean, and to these living specks the larger forms of life in the water must seem as huge and terrible as hungry sharks in the sea are to human beings. That little drop of water looks to the eye as clear and free from life as if it had been distilled from dew upon the petal of some fair rose. That there is in it life of any sort surprises us; that there are so many living creatures there of varying forms and sizes is almost impossible to believe until the microscope enables us actually to see them. If that bead of water holds such mysteries, what of the world in which it has so small a part?

Let us walk around the garden, and, as we look across its sunlit odorous spaces, let us ask ourselves if there are in it any secrets hidden from us. There lie the lawns and flower-beds and kitchen-garden, looking solitary enough. Besides the birds there is not a living thing to be seen. We walk about the garden, and wish our parents had made us zoo keepers—a glorious life!—so that we might always have had beasts and birds and

CONTINUED FROM 5886



reptiles about us, instead of this tame garden with nothing in it but flowers, and fruit, and vegetables, and trees, and creepers, and shrubs. Cabbages do not satisfy the soul when we sigh for crocodiles; lettuces are a poor substitute for lions; nobody would be content with a geranium when he is panting for a giraffe, or express thanks for a tomato when he yearns for a tiger.

In this discontented frame of mind we wander up to the conservatory, and sniff bad-temperedly at the flowers there. Suddenly a little voice beside us says: "Look, here are some frogs in the tank!" Yes, there they are, merry little things, some of the four hundred frogs which we reared from the early tadpole stage in the previous year, and, to the great horror of somebody, turned loose in the garden.

There is joy in this evidence of life, and it sets us thinking. After all, is this garden such a solitude? Are there not moles, and mice, and voles in any number beneath its surface? Are there not more frogs in the long grass by the edge of the stream; newts in the moist borders surrounding the glass-houses, and possibly a toad or two down in the stokehole of the furnace which warms the houses?



Why is the gardener so carefully washing the leaves of the young celery plants? It is because the leaves are smothered with the eggs of the celery fly. The cabbages are studded with the eggs of butterflies; the ants are busy shepherding aphides on the rose-trees. Why are the young peas and strawberry plants so carefully netted off? To keep the mice away. Things look more lively now, and we are less ill-tempered. A great horny beetle, with a host of little ones clinging to it, scuttles across a sunny walk, and we remember that that beetle is one of a multitude of kinds which make their home in the garden. Down in the soil, we remember, there are myriads of insects and lesser creatures. Here is a garden of three acres or less. Well, in it there are quite half a million fine fat worms, all steadily at work making the soil better. And then there are myriads and myriads of microbes in the soil, all at work for their own benefit and ours; there may be as many as 400,000 to a single cubic inch of soil. Things are decidedly looking brighter. We can leave the zoo to



THE OKAPI, WHICH WAS DISCOVERED IN 1899  
Specially drawn by Sir Harry Johnston

its keepers without further regret; we have got our own little zoo at home, all round us.

That is the sort of experience that any one of us can have. We go growling into the garden as into a place of solitude, quite lacking life, and find that, though we cannot see them, there are more living things in that garden than there are people in all the world. Now, the great zoologists feel at times as we feel. They say sadly to themselves, not that the world is without animals, but that it contains no more new animals, no animals with which they are not all familiar.

#### THE INSECTS IN THE WORLD TOO NUMEROUS TO COUNT

They know that they have not been able to fathom the sea, nor to classify all the insects and tiny forms of life, for that

no man will ever be able to do. There are more insects, both kinds and individuals, than most of us dream. That this is so we can prove for ourselves. Let us ask any of our friends which, in their opinion, would weigh the heavier—the backboneed things of the world, or the things without backbones? Ask them to imagine a gigantic pair of scales. In one side let them fancy that they put all the animals—men, elephants, rhinoceroses, hippopotamuses, lions, tigers, all the fierce animals, all the mild-tempered animals; the whales and seals and manatees, the sharks and all the big fish and little fish, and all the birds and reptiles and amphibians—put all those into one scale. In the other, put the insects of the world. Which, let us ask our friends,

will weigh the heavier? Our friends will say that the scale containing the backboneed animals will easily weigh the heavier. But in the judgment of great authorities, that is wrong; the little things are so many in kind and number that they will outweigh all the rest of the life of the world put together.

In this vast assemblage there are very many still to be discovered and known. But with the big things it is different. It is as to these that the zoologist grows sad. He has no new secrets to gain, he sometimes thinks. Then some splendid fact bobs up and kills his theory. He is not as wise as he thinks. There are more living things beneath the skies than he knows of. There cannot be very many more living things to be discovered, but not all the list of surprises is exhausted. It took years and years to find the little mosquito which carries disease and death to our countrymen who go out to tropical climates. The mosquito was there in abundance, but the brave men who were devoting their lives to the pursuit of it could not know that the mosquito was at work when they slept, and that when the men were awake the

## A GIANT LIZARD MAY BE LIVING TO-DAY



The African natives are very emphatic in their stories that a fearful creature, half elephant and half dragon, inhabits the huge swamps of Northern Rhodesia, and Mr. Carl Hagenbeck, the great European importer of wild animals, believed that some creature like the prehistoric brontosaurus really lives in these dismal and lonely swamps. This picture shows what the brontosaurus was like, and the cross on the map marks the place where it is supposed to live. The word brontosaurus comes from two words that mean thundering reptile. See page 14.

evil insect retired to rest. That is a little instance of the way in which members of the great animal kingdom succeed, age after age, in escaping the notice of man.

#### A PIGMY RACE, THAT KNEW THE SECRET OF THE OKAPI

Think of it—for thousands and thousands of years Africa has had a beautiful animal called the okapi, yet up to the present moment only a few white men have ever seen one of these animals alive. Until a few years back, any great zoologist would have told us that he knew of all the animals in the Dark Continent; yet here, awaiting discovery, was one of the most interesting creatures in the world—the connection link between the giraffes and the gazelles. When it became certain that the okapi really lived, the American Museum of Natural History sent men out to find one. As you may read in another place, they succeeded in their task, and though they failed to keep one of these beautiful wild creatures alive, it is so well mounted, and its silky coat is so soft and glossy that you might almost walk up to it in the belief that it breathes.

The manner of our learning of such an animal was in itself a little romance. Fairy books and travelers' tales have often told us of tiny pigmy men and women, but nobody believed that such people existed. Dwarfs there have been in plenty, but no one believed that there really existed tribes of pigmies.

But such men and women have been discovered in the heart of Africa, and Major Powell Cotton, when he got married, took his young bride to stay with the pigmies; and the brave girl-wife dwelt in the midst of the tiny savages while her husband went off into the forest, hunting strange animals. She can never forget the wonder of these people when they caught sight of her brushing her hair. These little people were the only ones who knew of this strange animal in whose existence scientists did not believe. *They* knew all about its habits. They knew that it eats only one particular sort of food, which grows nowhere but in these forests. They knew how shy and silent and solitary it is; how the scent of a man far away from it will make it desert its feeding grounds and fly for safety deep into the dense undergrowth, where not even the pigmies can follow. But the little men knew that there are

moments when they can steal up to it, and inflict a deadly injury with the poisoned arrows which they use. These were the little people who instructed our wise and daring scientist-hunters that the wise men have not yet learned all the secrets of Nature.

It is worth remembering, too, that this same traveler of whom we have been thinking, stayed some time with cave men and women in Africa. He found men and women and children living in tribes of three or four or five families, clad in skins, and making their homes in rough caves, living exactly as our forefathers lived in savage old Europe, when the mammoth and the hyena and the cave bear were there to share the land with them. These facts help us to realize that not every vestige of the old, old world has yet passed; that there are things still for us to see and know—animals in the wilds of which we had not heard; tiny men and women in the forest like the pigmies of the story-books; men and women in caves like the ancient Britons; men and women and children and domestic animals amid the eternal ice and snow, living just the lives which men and women lived in the Ice Age.

Facts like these make the thoughtful student wonder whether there are not in the world still more relics of the past which, hiding in the wild, untrodden ways of mysterious lands, have not yet been seen by hunter or traveler. He cannot but wonder if the so-called extinct monsters really all died out, or whether there may not still be some survivors. Scorpions exist to-day in much the same form that they have had since scorpions were first created.

The duckbill, that wonderful animal with furry body, bird's bill, and paddle-like feet, with which it can swim in the water and burrow on dry land, lives to-day in Australia, unchanged from the form in which its ancestors, which were among the first of all animals, originally appeared. It took years and years to make men believe the stories which the natives of Australia told of this remarkable egg-laying animal; and when at last a white man found the duckbill, and learned the whole story of its life, he cabled home the news, and had it sent from England on to Canada with as much excitement as if a new continent had been discovered.

# THE CURIOUS TUATERA OF NEW ZEALAND

Then we have the tuatera, a lizard living in the islands off the northeast of New Zealand, which has remained unchanged through ages since it first took its present form. Other lizards have changed enormously, but not the tuatera. There is a greater difference between the tuatera and the ordinary lizard than there is between the ordinary lizard and the serpent. The tuatera is the one creature on earth which still has three eyes. On the top of its head, under a fold of skin, which makes it useless, there lies that third eye, which all animals are said to have had at one time. In the young this can be clearly seen through the skin.

Now, inquiring naturalists say to themselves: "If these two creatures, together with the echidna, or spiny ant-eater, another practically unchanged animal, can have lived unaltered through all these millions of years, are there not some other animals still alive surviving from the old days?" And, believing that there is something in the theory, they go, or send men, into the wilds to find the answer to the question. One of the most exciting chases was one undertaken not many years ago to find the giant sloth of Patagonia. It had a body as big as an elephant's, and when it sat up on its mighty hind legs to pull down a tree-top to eat, it was fourteen feet high. These giant sloths were the animal lords of South America at the time when the mastodon and mammoth lorded it over North America. We cannot tell why they died out. One belief is that the enormous number of guanacoës, camel-like creatures which abounded in America, by constantly biting off the young

shoots of trees, killed all the forests in which the sloth lived. Goats killed the trees of all the hills of Greece and the plains of the Mediterranean countries, making all barren. Guanacoës may have done the same for that part of South America in which the sloths lived. That, however, would not explain the disappearance of the horse. There were once myriads of horse-like animals in South America, but when the first white man landed there, there was not a horse in the whole continent. These are mysteries for which we cannot account.



THE GIANT SLOTH

A few years ago a band of British hunters went to search for this monster in Patagonia, but were unable to find it. It is believed that it was tamed by primitive South Americans.

## DOES THE GIANT SLOTH EXIST?

Anyhow, naturalists sent out an expedition, fully believing that somewhere in the remote parts of South America the giant sloth still exists. The expedition was not successful, but we now know that the great monsters lived in caves with men, and that men and women and children made pets of them; for after all these ages we find the very grass which the men cut for the sloths turned into withered hay, in the caverns. It is not now believed that any of these strange animals are still in existence.

We got all our news about new animals from natives, therefore we are bound to pay attention to stories which come again and again to us from natives occupying quite different parts of the same country. The natives' tales of pigmies and cave men, of the okapi and of the duckbill, were long disbelieved; but, as we have seen, they were true. This fact weighs with the men who believe that there may be truth in the marvelous stories which are told of a fearful monster living to-day in the swampy heart of a great part of Africa, called Rhodesia, into which it is impossible for white men to penetrate.

# A STRANGE ANIMAL THAT MAY BE ALIVE IN AFRICA

The story was first heard from natives in Africa a good many years ago, by a trustworthy traveler named Menges. It came up again some years later when Carl Hagenbeck, the great importer of wild animals, received two different reports to the same effect. One of his own hunters, who had been in Rhodesia in search of animals, heard of it; and an English traveler, who had entered and left Rhodesia by a different route from that taken by Mr. Hagenbeck's representative, also heard of it. The natives described it as a huge monster, "half elephant, and half dragon," dwelling in the great swamps in the interior, which are hundreds of square miles in extent. There are drawings of such an animal in certain caves in Rhodesia, which suggests that the natives either have wonderful imaginations, or have actually seen such a creature. We know that in olden times they made drawings on stone and ivory, and on the walls of their caves, of reindeer, bears, mammoths, and other animals then living, and we find skeletons of the animals they drew, mingled with the remains of the men who scratched the pictures on the walls and on ivory.

Mr. Hagenbeck believed that such an animal as this monster might be found in the great and silent swamps of Rhodesia, and he sent an expedition to hunt for it. The hunt failed, for the men were laid low by terrible fevers, and attacked by bloodthirsty savages. Although he failed on this occasion, Mr. Hagenbeck, in a book that he wrote, called "Beasts and Men," said that he hoped yet to prove that this animal does exist. He thought it must be like the extinct brontosaurus. This was an animal sixty-five feet long, and weighing over thirty-five tons. It fed on the vegetation of swamps, and lived half in the

water and half on land; which, of course, is just the sort of life that would be led by this monster of which the Rhodesian natives tell to-day. Monsters such as this, and others still more fearful, once wandered over all the earth. Some of them must have lived on for ages after man appeared. Traditions of these dreadful beasts were handed down for centuries of generations. Their echoes still come to us in stories like Beowulf and St. George and the Dragon.

There are those who hope that some day we shall find that the quagga, that relation of the zebra which is supposed to have become extinct quite recently, is not dead; that somewhere or other, two or three lurk secure and unsuspected

by the deadly hunters. Men still go wearily seeking the moa, the giant bird of New Zealand, fully believing that the natives are right when they say that here and there, in the heart of the New Zealand mountains, these feathered giants still live. The same hope animates those who believe that somewhere in the less frequented islands of the Indian Ocean a dodo or two may linger in safety. Perhaps the most romantic faith of all

is that of the men who hold that the mammoth still exists in the North. Indian hunters from time to time bring back reports that far up in Alaska, almost at the coast of the Arctic Ocean, a solitary herd of mammoths still lives and flourishes. New things do come to light. It is not many years since Europe saw for the first time a takin, an animal which comes between the goats and the antelopes. The animal is too big, one would have thought, to have escaped attention. It is three and one-half feet high at the shoulder, and has great horns, with which it can kill a man; but because its home is mysterious Tibet, a land into which, until lately, it was dangerous for Europeans to go, until recently it was unknown.



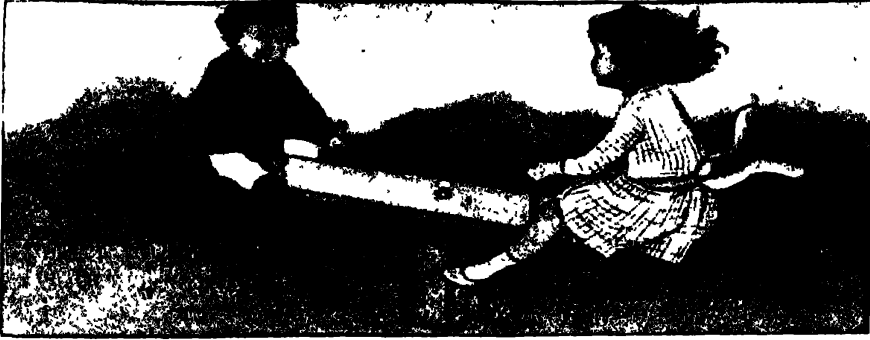
THE TAKIN, NOW IN THE LONDON ZOO

A creature from Tibet, was unknown until recently.

This photograph is by W. P. Dando, F.Z.S.

THE NEXT NATURE STORY IS ON PAGE 6061

## THINGS TO MAKE AND THINGS TO DO



### A GARDEN MERRY-GO-ROUND

ALL boys and girls love to ride on a merry-go-round, and perhaps some will be surprised to hear that a very good merry-go-round can be made and fixed up in the garden by any boy who is handy with tools; and what boy is not? Nearly every boy, too, has his own tool-box that he uses constantly.

We first of all get a stout post about seven or eight feet long and six or seven inches in diameter, or, if it is square, with sides of six or seven inches. Such a post can be bought quite cheaply at any lumber-yard, or a carpenter will get it for us.

We sink this wooden post about four feet in the ground, pressing in the earth well all round. The top of the post must be made quite smooth and level, and on it we balance a long, stout plank. This should be from eighteen to twenty feet long and two or three inches thick at least.

In the middle of the plank we bore a round hole sufficiently large for a bolt to go through. It is this bolt that will hold the plank down upon the upright post, while at the same time allowing the plank to work easily upon it. Of course, while the hole has to be slightly wider in diameter than the diameter of the bolt, it must not be so large that the plank will be able to slip over the head of the bolt. And we must remember as we bore the hole that the bolt itself will work out the sides, so that it can be quite tight fitting at first.

The plank is placed in position on the post, and a hole having been made in the post to receive the bolt, this is screwed or driven home, so that only sufficient is left above the plank to allow this to work round easily on the post. The bolt should be a long one, some twelve or fifteen inches in length, or it will work out of the post.

At right angles to the plank, and about three feet from the ends, pieces of wood should be fastened, as in the picture, to serve as handles, by which those riding upon the merry-go-round can support themselves.

(CONTINUED FROM 5923)

All that is needed now to make the merry-go-round quite ready for use is some soap for the top of the pole, to go between it and the plank, and enable the plank to slide round easily.

The method of using this home made merry-go-round is obvious. Two boys or girls take their places—one at each end of the plank—and then, by using their feet as levers, send the plank round and round faster and faster; it is, of course, necessary to hold on firmly. There is more fun to be had out of a merry-go-round made in this way than even out of a see-saw.

If the merry-go-round is intended for big boys and girls, the upright upon which the plank is to work should be larger than that suggested at the beginning of this article. It should be twelve inches in diameter, and in fixing it in the ground it would be well to make some liquid cement and pour this round the post, leaving it to set. In this way the post would be held firmly in the ground, and not be likely to work loose.

Where there are many children who usually play together, the fun can be more than doubled, by making another plank cross this one at right angles. The two must be firmly bolted together—it is not wise to use nails as they are likely to pull out—by at least four bolts through both planks. By adopting this plan, four can ride at once, and as the merry-go-round flies around we seem to see only a tangle of arms and legs and hair, and the shrieks we hear show how much fun all are having.

Of course, this post and one plank can be used for a see-saw, as well as for the merry-go-round. When used for this purpose, however, the hole in the plank must be a little larger, so that the bolt will have plenty of room, or else our see-saw will not allow the plank to go down quite far enough. Also the sharp edges of the post should be rounded off, or else we shall find that the see-saw will bump as it goes up and down.

## THREE THINGS FOR CLAY MODELING

THE familiar things appearing on this page are intended for clay modeling. They can be easily made from the instructions given here. They are intended to be carried out to a fairly large scale, and, instead of forming them out of spheres or cylinders, as we have done with plasticine, we shall build them up bit by bit to the required size on our slate.

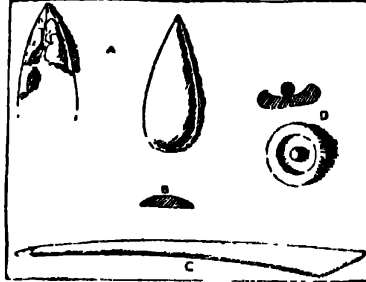
Let us take the first exercise—a simple rosette with four petals.

As we are making this a good size—say, eight inches across—we must not try to model the petals in the fingers and then lay them in position, for the work must look as though it were united to its background. It is to be definitely *semi-relief*, and this will not be the case if it is detached from the background

process. Working together, the fingers seem to help one another, and we can keep the outline even. On no account must the work look smeary and ragged in outline, and without great care and considerable patience it will very quickly become so.

"Take care of the edges" is an important rule for all stages of modeling, especially during the earlier stages of low-relief work. If there should be any tendency to smearedness, the edges may be cleaned up by the aid of a little wooden tool like the shape shown at c. This can either be bought for a few cents or it can be made with an ordinary

penknife and then rubbed over with fine sandpaper in order to make it quite smooth. Its use is chiefly to clean up the edges of



PARTS OF A ROSETTE



A ROSETTE

A BUTTERFLY

A BELL-PUSH

in the working. Secondly, it must look plastic—that is, it must have a modeled appearance rather than seem as if it had been "stuck on." Nor must we put a rough piece down and carve out the shape; it would scarcely be "modeling" under such conditions, and the result would be more suggestive of carving tools than of the pliable fingers.

To begin, mark with dots the positions of the extreme points of the rosette and lightly draw the shape of each petal, making the length about three and a quarter inches. We now break off little pieces from our lump of plasticine, and proceed to build up the topmost petal as at a in the first picture, preserving the outline as we press each piece into position. We shall find it a distinct help to use together the tips of both forefingers during this shaping

the work when they become ragged or smeared, and since its point is fine, to model up those parts which are inaccessible to the fingers. Build up each piece to the section b which suggests the proportionate depth, or thickness, and make the surface smooth. It is

well to revolve the disk while we model each petal, for we should have the point away from us during the process.

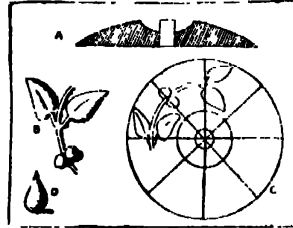
Having completed the four petals, we may make the centre by rolling a ball

and pressing it so as to make the hollowed disk, d. It should be sufficiently large to fill the central space. Another small ball is then rolled and placed in the centre of the depression.

The second picture shows a butterfly, which, though differing largely from the rosette, is built up in a very similar way.



PARTS OF THE BUTTERFLY



PARTS OF THE BELL-PUSH

## MEASURING A TOWER WITH A LOOKING-GLASS

The head and body, A, should be modeled first to a convenient size, and we ought to have no difficulty with this, as we adopt the same method as we used in making the petals of the rosette. The upper pair of wings must next be done, and, having lightly sketched them in to a proportionate size, we build up the clay to the section shown at B. This section is taken right across the middle of the upper pair of wings. We must notice that *all* the wings are joined to the *upper* portion of the body, while the lower part is free of all attachment. We now proceed with the second and smaller pair of wings, a section of which is given at C.

The antennae are made from very thinly rolled strips, one end of each being curled up into a tiny ball as at D.

It is true that neither the antennae nor probably the butterfly itself would be quite this shape, but we must remember that we are decorators—for modeling is largely a decorative art—and decorators, like poets, take a certain licence in the treatment of their subjects. Our picture shows only a much simplified form of butterfly. There are, of course, many types. At E and F are shown sketches of one upper and one lower wing of a different variety, and we shall find it an excellent exercise to make a study of a real specimen.

The third model is an electric bell-push. On our slate we mark a circle of about four inches diameter, and in the manner already described we build up a disk of the section shown at A. This should be made smooth and free from all depressions, excepting, of course, the one at the top, in which the push is placed.

The actual hole through which the push passes can be ignored at this stage.

The disk finished, we have the problem of fixing on our ornamentation. This is quite a delicate process. First, let us look at the sketch of the ornament at B. It consists of simple leaves and berries on a continuous stalk. Now upon our disk we mark lightly with a fine point the position of this stalk, and also the positions of the leaves and berries. We shall see that there are four pairs of leaves and four pairs of berries placed at equal distances from each other. We obtain the positions by dividing the disk up into eight parts, as shown at C in the last illustration. The stalk is a thinly rolled-out strip, placed and gently pressed into position. The berries are tiny balls rolled in the fingers and then pressed into their places.

For the leaves, small pieces must be rolled into the pointed pear-shape shown at D. Each piece is then put in place, pressed, and carefully worked with the finger-tip and tool till it appears to be just a raised portion of the disk. Tiny strips are added for the leaf-stalks. These must be carefully attached to both leaf and main stem. In all fine work such as is required in this exercise the little tools we have introduced will often need to be used, for, however small our fingers are, there are some parts of our modeling to which they will be inaccessible.

To give the roughened appearance of the background it is only necessary to stamp it lightly with the end of a match or similar tool. The centre push is a short cylinder a little thicker than a lead pencil. A hole is bored through the centre of the disk to receive it.

## MEASURING A TOWER WITH A LOOKING-GLASS

THERE are various ways of measuring the height of a tower or tree or house, but one of the simplest is by means of a looking-glass. We take the looking-glass some distance from the tower or other object which we wish to measure, and lay it on the ground, with the reflecting side upmost, as in the picture, where A B is the tower and C the looking-glass.

We then walk backwards farther from the tower, until we can see the top of it reflected in the glass. Next we have to measure the height of our eye, D, from the ground, E, the length of EC and of CB. It is rather hard to take our own measurement, but if we do not know it or if we have no friend with us, the best way is to notch a stick and measure it afterwards. Use little sticks to mark the positions of E and C, and then pace out or measure the distance with a line or a stick.

Now, in order to get the height of the tower, we simply have to work a sum in proportion.

As CE is to ED so is CB to BA. We know three of these measures, so that we can easily find the fourth. Thus, if the boy's eye is five feet from the ground, and

he is standing six feet from the mirror when he sees in it the reflection of the point A, and, further, if the distance from the foot of the tower to the mirror is twenty-four feet, then the height of the tower is twenty feet. It is essential that the mirror be placed on the ground quite horizontally. If we have no looking-

glass, we can make a mirror by putting some water in a dark pan or tray, or even a natural pool can be used. In such cases we can move until we see clearly the reflection of the top of the tree or tower at the edge of the pool. Of course, a pool or tray of water can only be used for the mirror if there is not much wind.



THE LOOKING-GLASS PLACED IN POSITION



## PUTTING A NAME ON A HANDKERCHIEF

WE all know how very dainty and charming an embroidered initial makes a handkerchief, but only few of us may know how simply and quickly this little addition may be made. And yet a little patience, and a knowledge of two of the simplest embroidery stitches, are all that are needed to obtain the most delightful and pleasing results.

Let us suppose we have never done such work before, and see how to set about it.

To begin with, we must remember to choose a linen handkerchief and one which is not too fine. Linen is firm to work on, and is not so apt to pull and pucker as a thinner material, like cambric. It lasts much longer also, and we shall think our work all the more worth while. The next thing to consider is the initial itself. We cannot all draw well enough to sketch one ourselves, and it is not easy to find something suitable to copy from. A good place to search is on the title-page of a well-bound book. The letters on a title-page are designed by good artists, and are, as a rule, well proportioned and very clear. Old hymn and Psalm books are places in which to find really good letters.

There is a great difference in letters, and we shall, perhaps, have to search through several volumes before we hit upon exactly what we want. We must choose one that not only pleases us and has a pretty shape, but at the same time is not too much curved or over-elaborated. The first picture gives us an idea of five sorts of letters to choose. Any of these work out well. The letter should be of a fair size, for the smaller it is the more difficult it will be to work. One which measures from one-half of an inch to three-quarters is the best to start with.

When we have chosen our letter from the book, we transfer it to the handkerchief in this way. We get a scrap of tracing-paper, trace off the letter, and then blacken the back of the tracing-paper with a soft lead pencil.

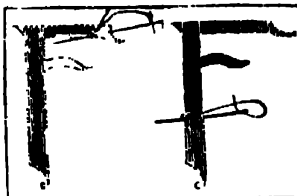
We lay the linen handkerchief on a drawing-board, and pin the corner out flat. Then we place the traced letter in position, black side down, of course, and go over its outline with a sharply-pointed hard pencil. We remove the tracing paper, and find that the blacklead on the back has allowed a faint outline of the initial to appear on the linen. With a very black and hard pencil we strengthen this outline, but keep it as fine as possible. Then we moisten the letter with

a sponge, and wait till it dries, or iron it dry. This process will more or less "fix" the lead-marks on to the material and prevent them rubbing off while we are working. A loose, soft make of cotton is best for the embroidery, one which is very little twisted. Several well-known brands are almost equally good for this work.



THE KIND OF LETTER TO CHOOSE

First comes the padding stitch, which can best be understood by looking at the second picture. We use the same cotton, and arrange our stitches in the up-and-down direction shown, taking care to place more in the middle than at the edges, where we turn them off. Then comes the filling stitch, which is shown in the same picture. This goes across in the opposite direction to the padding



Padding and filling-in stitches.

stitch, as can be seen in the picture. We make these very closely together, entirely covering the padding. It is important in this part of the work to follow the outline very carefully; a stitch that falls just short of, or over the outline will spoil the finish of the initial entirely. We should take care to keep the

material held well down between the thumb and finger of the left hand as we go along, to avoid any puckering or pulling of the linen and finish off at the back neatly. We must also try to follow the pencil outline very faithfully.

If our thread gets at all twisted we must notice this, and at once turn the needle round several times in the opposite direction. The threads, if twisted, will not

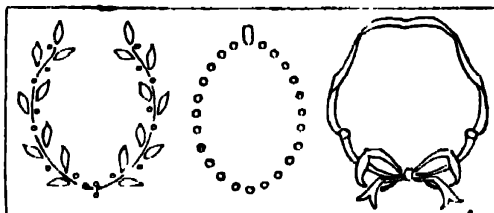
"bind" together and look smooth on the letter when finished.

The plainest letter will look well if neatly done, neatness and precision being the chief points in this work.

An excellent plan—it we wish to make our

design a little more handsome and distinctive—is to fit round the letter a little border or wreath such as is shown in the third picture. The little patterns are padded and worked in exactly the same way, of course, as the letters themselves.

One great advantage of giving a handkerchief to a friend for a present is that it is always most acceptable. No one can ever have too many which is not true of all presents.



DESIGNS FOR THE BORDERS

# HOW TO LOOK AT WHAT YOU DRAW

## THE BEAUTIFUL SHAPES OF THINGS

**E**VERYTHING in life is relative. One boy is spoken of as strong because we know another who is not so strong, or is weak. Every assertion we make is the result of a comparison, and our judgments will be valuable just so far as we have considered the unknown in the light of the known.

The ancient Greeks considered drawing and writing as essentially the same process, and they used the same word for both. And if Pharaoh wanted to proclaim that a hundred ducks were consumed at one meal in his Court he employed a draughtsman to register the fact on a frieze by picturing a row of cooks occupied in preparing the hundred ducks. Writing is then only a later development of

and the other shut out. When we wish to draw the one, we must watch the other. We are not interested in anything contained in the shut-out space, so that our minds are free to consider only the values and directions of the boundary lines. By watching the shut-out space we see the boundary lines of the enclosed space big and simple. Our interest finally lies with this the object. We draw an object by looking at the shapes of the spaces beyond it. An object makes a pattern with the background, and it is this pattern that we must draw. For this is what we call the music of shape.

Place a cardboard box upright on the table. Behind it put a sheet of white paper covered



A picture showing the beautiful harmony between a mass of buildings and the surrounding country.

A picture showing the simple musical shapes of a street scene.

drawing, which has its alphabet just as writing has.

We have found that the alphabet of drawing consists in the true lengths of lines coming against each other, and that the shapes enclosed correspond with the syllables of words or the phrases of music. We have seen that it is necessary to study a form before we can attempt to draw it. Drawing is recording facts we know. It is in its truest sense "memory drawing." We are not copying; we only refer to the object when we find that our knowledge of it is hazy. Our hands will do their work faithfully and beautifully if our minds are fixed upon realising *the whole*, and not dwelling upon details.

Boundary lines not only enclose shapes within them, but are division lines between surfaces. They belong to two sets of shapes, one enclosed

with upright lines, from one to two inches apart. Notice the position of the outer corners of the edges of the box in relation to the vertical lines—that is, that they are not all equally high. Mark these points on the background, and join them. The far edge of the table appears to touch the object one-quarter, perhaps, or one-third, from the bottom. Mark on the background the exact position, and draw the edge as it stands out from each side of the box. Darken the background beyond the box.

Let us step back and survey our work. We shall see the white box standing out against the darkened paper. If we remove the box we shall see its outside shape appear as a white space on the dark background, just what we saw when the box was there. Now let us examine this

drawing of the external shape of the box. First let us examine the values of its boundary lines. Which line is the longer—the line of the table or the line of the left-hand side of the box?

Are they of equal length? If not, how much is one longer than the other? A half, a quarter, and so on. In this manner compare the lengths of every line on the background, remembering that slovenly observation is of no value at all.

Now we will examine the *shapes* on the background. Let us turn to the left-hand side. We have here two sides of a shape given us; they are the edge of the table and the left

edge of the box as far down as the bottom of the background. Is it as long as it is wide? Is it longer, and, if so, by how much? That is, would it make a square or an oblong? Decide what the shape would be. Treat all the boundary lines in the same way, completing in imagination their suggested shapes. We must

Every line is relative as regards its direction as well as its length. When we draw a line, we can judge its inclination accurately by looking beyond the object at something else which

has lines of whose direction we are quite sure, such as the vertical lines of the legs of desks, wall-panels, doors, and window-frames. So now do away with the striped background, and glance beyond the object you are drawing to see how much the direction of its boundaries varies from the vertical of some known upright line.

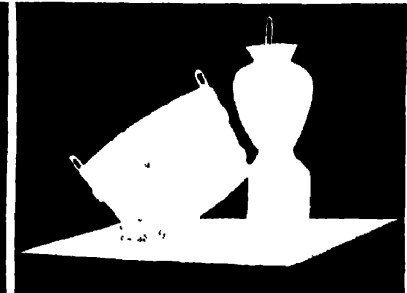
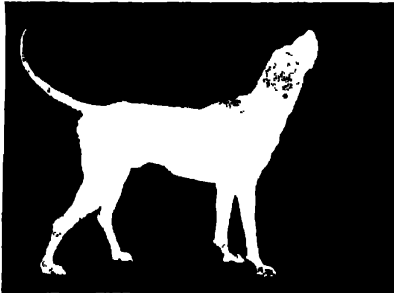
In this manner picture on your paper other objects, such as an open box, chairs, and toys.

Place several of them together to make a group, and draw the pattern it forms upon the background. Then make a second drawing, and fill in the internal details, shape against shape.

Take a spray of privet, and place it before a sheet of white paper. Draw this on



Pictures showing that the attitudes of figures are best expressed by their simple, beautiful shapes against their backgrounds.



Pictures showing the musical shapes, or patterns, which objects and their backgrounds make.

always ask ourselves if the completed background shapes would make a square, an oblong, or a triangle, wherever a space appears beyond an object or a group of objects. We must look from one to another, and judge their relative values—their values, that is to say, as they compare one with the other.

When we have drawn these background shapes, we find that we have the perfect external shape of the object before us. It is far more truly represented than it could have been had we looked at the *object* while we were attempting to draw it.

Mere mechanical, *mindless* copying is impossible when drawing in this way. During the whole time we are judging and finding out the different values of the shapes. They are no longer prisoners waiting to be judged: they are becoming friends. Each must receive from us quiet and courteous judgment.

tinted paper with white crayons. Fill in the background with the white crayon, or draw it with pencil on white paper, and fill in the leaves. Now we have before us dark patches on a white ground, which are just like the dark leaves in front of the white paper. Look carefully, and compare the shapes of the background between the leaves. We might mark them one, two, three, and so on, beginning with the largest or with the smallest. Call the roll of these soldiers without fear or favor. Draw other sprays of leaves and flowers in the same way. Where several leaves overlap, draw the shape of the mass, not the separate leaves.

Let us try to tell another exactly what kind of music was in the heart of the architect when he planned the houses opposite to us. To do this we must not look at the details on their fronts, but at the sky-line, and note the

## AN EASY-MADE SHELTER

shapes made on the sky background. If they are all alike, the music is monotonous; it is the broken sky-line, with its variety of shapes beyond, that gives us such pleasure when we visit old-world towns and villages.

So let us carefully compare edge with edge of the shapes of the sky beyond the buildings, and decide what each shape would make if completed. Draw these, and fill in the background neatly with white crayon, enclosing the whole as in a frame. Make a picture of it. Our buildings are now standing out as a dark mass against the light sky.

As we walk into town, or ride on the top of a tram or bus, let us look at the sky-line before us. We notice what a broken line it is. We see church spires standing above the rest of the houses like stately lilies among the lower garden plants, or a beautiful town-hall with its turrets and towers and gable windows.

As we look down the streets where the sky-line is evenly broken, our eyes soon refuse to dwell on them. We are glad to look up to the sky where the shapes are more varied and the music more joyous. Let us glance from the monotonous sky line down to the houses below; we find them built all alike. There is very little that is happy or musical about them, whereas we find that the houses which

had beautiful shapes against the sky have also pleasingly-shaped windows and gables.

We now know how to read the story that is written on the face of the sky. When we visit another town, we shall know more of the people of that town than they think they are telling us. We know either that they are telling everyone that they love this beautiful music of shape, and will have it about them; or else that they have either never heard of it, or do not care about it. Ugly, unmusical surroundings make us unhappy and miserable. This is not right; we are meant to live joyous lives. We want our towns and villages to be beautiful, and we now know wherein this beauty and music lie. By dwelling in the City Beautiful, our own work, too, will be beautifully done.

### PLAY LESSON

Draw the sky-line of the streets near your home. Draw every one through which you love to look. You will soon find out why they attract you. Make a picture of your school: you may find that it is a beautiful building. If we look out of the window as night is coming on, we shall see the houses as a dark mass cutting against the lighter sky. Draw these as you see them.

## AN EASY-MADE SHELTER

IF we are out scouting or camping, and wish to make quickly a shelter in which we can sit and rest, at the same time being shielded from wind or rain, this can be done quite easily. We stand three branches together in the same way as soldiers stand their rifles when they are resting, and of course, if the ends of these branches are forked, they can be supported against one another all the more securely. Then, leaving an opening in front, as seen in the picture, we pile up small branches and brushwood round the uprights, pressing them closely together, until we have a shelter like that shown.

By sitting in this we can get protection from rain and wind, provided, of course, that we make the opening face the direction opposite to that from which the wind is blowing. Another way to make

use of branches and brushwood if we are caught far from camp on a canoeing trip, is to draw up the canoe and tightly pack it with soft leafy branches, leaving only enough space for the body. Great warmth can be thus obtained. In open country and wooded districts, branches and brushwood are always accessible, and to build a shelter like this is the work of a very few minutes. It is also very useful as a shady nook.

A clever boy can, from this picture, get an idea for a little shelter that is well worth building as a permanent resort in the garden. If straight branches be selected to pile up against the uprights, and they be fastened with tarred string, a little summer-house will be formed that will prove useful and at the same time, so far from looking unsightly or crude, will have a neat, rustic appearance.



The shelter complete.

## HOW TO MEASURE THE DIAMETER OF A BALL

TO measure the diameter of a ball exactly may not seem a very easy task, but there is a way of doing this which is quite simple.

Take two blocks of wood, or two boxes, a little higher and wider than the ball, and stand these on a table with their sides pressed flush against a wall or against a larger box standing on the table. In between the two boxes or blocks place the ball as shown in this picture, and still keeping the

sides flush against the wall, bring the two boxes together until they touch the ball.



All we have to do now is to take a rule and measure the distance between the two boxes, taking care of course, to keep all the objects quite still and level. With the diameter thus accurately measured, we can obtain the other dimensions in the usual way as, for instance multiplying the diameter by

3.1416, or, roughly, 3 $\frac{1}{7}$ , to get the circumference

## A GARDEN GROWN ON A WALL

THERE is many a naked and unsightly wall in town and country that might, with little trouble, be beautifully draped in Nature's garments of restful green, with patches of blue and red and yellow. Some of the most pleasant memories of those who have traveled in England are the walls of the old cloisters long since fallen into decay. No one who has been in Peterborough can ever forget the walls around the cathedral there. There are some old walls in New England which are equally beautiful.

Some walls, of course, have their covering of Virginia creeper, and, in the proper season, their thick and gorgeous mantle of sweet peas or nasturtiums, but the roots of these plants are in the ground, and it is not always convenient to have a flower-bed at the foot of the wall.

### A WALL COVERED WITH BLOSSOM

Far more interesting than any such covering as has been mentioned is a real wall garden, with plants actually growing on the wall, and if we will take a little care with this novel garden we can get a rich harvest of blossom from early spring right through to late autumn.

The best kind of wall for a garden is an old stone wall, from whose joints the surface mortar has crumbled and fallen and made crevices into which the roots can find their way and take firm hold. We can prepare the wall by knocking out joints and corners of brick to make little artificial pockets here and there where we wish to have our plants.

All along the top of the wall, too, we can form pockets by placing rough stones together, so as to leave recesses for the mold. Holes made with a chisel, even, are large enough for plants to take root in. The pockets must be filled with damp soil.

We do not need rare and expensive flowers for our purpose; in fact, we can cover our wall with familiar wild flowers. If, however, we decide to have some of the cultivated varieties of flowers, it will be best for us to raise the seed in a greenhouse, and then when the roots are well formed to plant out on the wall. This is done by lifting the whole plant with the little mass of earth that is held together by the roots, and pressing it down into the moist soil in the crevices or pockets of the wall.

### PLANTS FOR SUNNY AND SHADY WALLS

Of course, in selecting plants for our wall garden, we must take into consideration whether the side on which the garden is to be is warm and sunny or whether it is in the shade most of the day. For the sunny side some of the dwarf campanulas, or bell-flowers, are excellent. The wall campanulas are particularly suitable. Rock pinks and other hanging-plants like *cerastium*, *alyssum*, *aubretia*, *arabis* and *gypsophila*, which, though they grow happily on the level, do best when they use the upright wall out of which to hang.

Seeds and cuttings should be planted in a light soil in June, and placed on the wall as

soon as ready. The sedums or stonecrops, and the *sempervivums* or house-leeks, are also good. Snapdragons and Iceland poppies are all very useful flowers for a garden, and wallflowers are, of course, particularly suitable and effective, as those who have seen the cloister walls of Peterborough Cathedral in spring and early summer well know. These walls are literally a blaze of golden color.

On the shady side the yellow *corydalis* is easy to grow, and is very pretty with its dainty foliage. Garden primroses and anemones are thankful for a place at the cool wall-foot. London pride, too, looks charming when grown in the wall with its dainty cloud of pink bloom puffing out from among fern-frond masses. The mossy saxifrages, and many of the hardy primulas or primroses can also be grown.

Many alpine plants will grow on an old wall, on the sunny side stone crops large and small, and a variety of many-colored phlox.

But beautiful and interesting as the wall garden is when covered with flowers supplied by the nurseryman, it is still more interesting and quite as pretty when all the flowers that grow upon it have been collected by us during our rambles.

### WILD FLOWERS FOR THE WALL

Among the sedums we should secure biting stonecrop, which is very common on rocks and sandy ground; English stonecrop, which is found in similar places near the sea.

Some of the toad-flax family will flourish in a wall garden. The ivy-leaved toadflax, or mother-of-thousands with its delicate foliage and trailing stems with myriads of blue or white blossoms is a very charming plant for a wall, and the common yellow toadflax, better known as "butter and eggs," will also grow well on a wall, as many of us can testify.

One of the most showy and handsome wild plants for a wall garden is the red valerian. It is often grown as a garden flower, and will thrive nowhere better than on an old wall.

The money-wort, or creeping jenny, with its trailing stems, shining leaves, and bright yellow flowers, is a plant that no wall garden should be without, and has become naturalized in America. It blooms from July to September.

Willow-herb, or golden loosestrife, the wild pinks, the sea-pink, the early saxifrage, the purple mountain saxifrage, the yellow mountain saxifrage, the wild hop, the white arabis or rock-cress, viper's bugloss, and the yellow alyssum are all familiar wild flowers that are easily found and excellently suited for a wall garden.

Some may prefer to cover a shady wall with ferns, and certainly small ferns look nowhere better than when growing in such a position. Many varieties will grow on walls, at the foot could be grand tufts of hartstongue with its cool pale fronds to foster the feeling of shade, male fern and osmunda. A little higher up maiden-hair spleen wort and the common Christmas fern would do well.

CONTINUED ON PAGE 6077.

# A STORY-DICTIONARY IN ENGLISH & FRENCH

## DICTIONARY

**Ability** means power.

**Au-delà** means beyond

**Bedouins** are a tribe of Arabs who live in the desert.

**Beverage** means a drink.

**Common** means general, for the use of all.

**Conclusion** means end, finish.

**Conduisit** is the past of **conduire**, to conduct, or to lead.

**Couvertures** means covers.

**Custom** means way of living and acting.

**Defend** means to guard, to protect.

**Employment** is the present of **employer**, to employ, or to use.

**Exhiba** is the past of **exhiber**, to exhibit, or to produce.

**Firearms** are weapons that are fired by gunpowder, like pistol.

**Guest** means visitor, a friend staying with us.

**Hookah** pipes are pipes with long tubes, smoked through water.

**Hospitality** means the receiving of visitors generously and kindly.

**Laine** means wool.

**Mieux** means best.

**Nous voilà** means there we were.

**Privilege** means an advantage or pleasure enjoyed by some particular person.

**Prolong** means to extend to make longer.

**Reclined** means leaned, rested.

**Recounting** means telling over again.

**Se coucher** means to go to bed.

**S'enveloppa** is the past of **s'envelopper**, to wrap one self up.

**Sous peu** means in a short time.

**Tous les deux** means both of us.

**Traient** is the present of **traiter**, to treat.

**Utmost** means the highest, the furthest extent.

**Vinrent à notre rencontre à cheval** means came to our meeting or to meet us—on horseback.

## A VISIT TO ARABIA

Frank had been on a visit to Arabia, and he was *recounting* his experiences to some of his school friends.

"They don't live in houses in the desert," he told them, "but in great tents, and as soon as they saw us coming the old *Bedouin* and his little son, *Hamid*, rode out to welcome us.

"*Hamid* is a fine little fellow. I don't suppose he has ever played football or cricket in his life, but he is a splendid shot. Their life is so different from ours that Arab boys are taught to *defend* themselves when they are quite little, and they would rather play with *firearms* than with any toy you could give them.

"The *Bedouins* are famous for their *hospitality*. While you are their *guest*, they serve you to the *utmost* of their *ability*; but you are not expected to *prolong* your visit after three days, and when you leave they pass you on to some other friend.

"But I think you see the strangest of their *customs* at dinner-time. We all sat on rugs round a low table, and on the table was a great dish, from which everyone helped himself with his fingers—for they don't use knives and forks in Arabia."

"There was plenty to eat—goat's meat and rice, hot cakes, fresh fruit, and the most delicious coffee. The Arabs are very proud of their coffee, and it is the *privilege* of the eldest son to pound the berries for the father to make into a *beverage*.

"When I was ready, the old *Bedouin* picked out a choice bit of meat and put it into father's mouth—because he was the chief guest—and then each one helped himself out of the *common* dish.

"At the *conclusion* of the meal the men *reclined* on cushions, and smoked long *hookah* pipes, and when bedtime came *Hamid* took me over to his corner of the tent, and brought out a couple of blankets. He gave one to me, and rolled himself up in the other, and before long we were both sound asleep."

## UNE VISITE EN ARABIE

François avait visité l'Arabie et racontait ses aventures à quelques-uns de ses camarades de collège. "Ils ne vivent pas dans des maisons dans le désert," leur disait-il, "mais sous de grandes tentes, et aussitôt qu'ils nous virent arriver, le vieux *Bédouin* et son jeune fils, *Hamid*, *vinrent à notre rencontre à cheval*.

"*Hamid* est un beau petit garçon. Je suppose qu'il n'a jamais joué ni au football ni au cricket de sa vie, mais il est bon tueur. Leur vie est si différente de la nôtre, que l'on apprend aux jeunes Arabes à se défendre quand ils sont encore tout petits, et ils préfèrent jouer avec des armes à feu qu'avec tous les jouets que vous pourriez leur donner.

"Les *Bédouins* sont fameux par leur hospitalité. Pendant que vous êtes leur hôte ils vous *traitent* de leur mieux, mais votre visite ne doit pas se prolonger *au-delà* de trois jours, et quand vous partez ils vous passent à quelque autre ami.

"Mais je crois que vous voyez la plus étrange de leurs coutumes à l'heure du dîner. Nous étions tous assis sur des carpettes autour d'une table basse. Et sur la table il y avait un grand plat dans lequel tout le monde se servait avec ses doigts—car ils *n'emploient* ni couteaux ni fourchettes en Arabie! Il y avait beaucoup à manger—de la viande de chèvre et du riz, des gâteaux chauds, des fruits frais, et le plus délicieux des cafés. Les Arabes sont très fiers de leur café et c'est le privilège du fils aîné de broyer les grains dont le père préparera le breuvage.

"Quand tout fut prêt, le vieux *Bédouin* choisit un morceau de viande qu'il mit dans la bouche de mon père—parce qu'il était le premier hôte—et puis chacun se servit dans le plat commun. Quand le repas fut terminé, les hommes se reposèrent sur des coussins, et fumèrent leurs chibouques, et quand vint l'heure de *se coucher*, *Hamid* me *conduisit* à son coin de la tente, et *exhiba* une paire de *couvertures* de laine. Il m'en donna une, et *s'enveloppa* dans l'autre, et *sous peu* nous voilà tous les deux dans un profond sommeil."

# HOW MANY PEOPLE CAN YOU FIND IN THIS PICTURE?



In this picture of a village common there are a number of people shown; in addition to those whom we can see clearly, there are a number of others indicated by something they are holding, by part of their body, or in some other way. Look at the picture and see how many people you can discover. There are fifty-six, if you find them all.

## The Book of OUR OWN LIFE



This gives an idea of how the blood flows through the liver to be purified on its way to the heart. The great veins subdivide into smaller, which become finer as they go through millions of cells.

### THE KITCHEN OF JACK'S HOUSE THE WONDERFUL CHEMISTS AND THE WORK THEY DO

AS we know, Jack's wonderful house is a three-storied one, but it is raised from the ground on Jack's legs, like the houses we see in some places in the Far East; and so his kitchen, or ground floor, is some distance from the ground, and "rises in the world" as Jack's legs grow longer.

This kitchen, which is really the lower part of Jack's body, contains many things which Jack would die without, though most of us have never heard of them. All this is perfectly true, and almost new; and there is so much to learn, that for many years to come, the progress of science in finding out how to repair Jack's house, and in knowing how best to build it up, will largely depend on what we are now learning about various things in Jack's kitchen which have been despised hitherto.

Perhaps the strongest of Jack's many strong points is the number of clever chemists he keeps working for him. As long as he lives they are busy all the time making things which Jack's house could not do without, and which make all the difference to Jack himself. We already know that Jack himself lives in his study in his

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top story, his observatory. The ordinary way of saying this would be that the mind lives in the brain, for, of course, Jack's mind is the boy himself.

One of many new discoveries which have been made is that all sorts and parts of Jack's house are constantly engaged in providing special materials which reach Jack's brain, and make all the difference to it and to him. So true is this that there is, for instance, half-way up the stairway between Jack's top and middle stories, something called the *thyroid*, without which Jack would certainly be an idiot. All of the wise people who study the brain intelligently know that they must study the body too; for it is true that the house a man lives in will often make a great deal of difference in the sort of man he is.

Thus, for instance, there are two small private chemical laboratories in Jack's kitchen which we know now are the workshops of clever chemists without whom all the work of Jack's house would stand still. When we find a private chemical laboratory in Jack's house we call it a gland, and we find many thousands of these glands everywhere—those



that make the sweat, those that make the saliva, and hundreds more. The little glands in the kitchen lie pressed one to each kidney, and they are called the *adrenal* glands, or adrenals, which simply means "to the kidney." The common rule is that the various laboratories in the body have a tube, or duct, running from them and carrying whatever they make to wherever it is wanted to go. Thus little ducts run from the salivary glands to the mouth. But these adrenal glands, like several others found in different parts of the body, have no ducts.

**THE OLD THINGS IN JACK'S HOUSE THAT HAVE LATELY BEEN DISCOVERED**

These glands are called the ductless glands, and they have long been a puzzle, and some people have declared that they are nothing but a sort of lumber, which Jack had inherited from some of his ancestors, who lived in a different style from his own, and had use for such things which Jack has not. This idea, that Jack's house is an old curiosity shop, full of rusty and battered relics of Jack's forerunners, has something in it, but a great deal less than many people have supposed; and there are a good many things which have been called useless heirlooms of Jack's which are a great deal more necessary to him than his stomach.

The ductless glands are a case in point. The blood runs through them, and in the case of some of them as it leaves them it carries something which it had not before, and which makes all the difference to Jack. Where that is not so, the blood which comes away is without something which was in it before; and that something is poisonous or dangerous rubbish, which the chemists in the gland have destroyed, usually by burning it up.

**THE TUBE THROUGH WHICH POWER COMES TO THE MUSCLES**

The adrenal glands belong to the class which make things, and the thing they make was discovered some few years ago by a Japanese scientist, Doctor Takamine, in New York, though another man found it out about the same time. The thing they make is carried throughout Jack's house, and its business is to give power to all those servants of Jack called the muscles. Without this wonderful substance the muscles cannot do their work, the blood is not properly

pumped into Jack's study, and that means that the ventilation is impaired and Jack gets drowsy and stupid, as we should expect. The working of his brain becomes changed, a doctor would say, because of lack of the adrenal secretion. If the lack continues, Jack dies. This happens in rare cases, when certain microbe burglars break into these glands and smash them, killing the chemists and taking their places.

These are the smallest of the special glands in Jack's kitchen, but in this whole house there are none more important than these tiny bodies, for Jack's life depends upon them. The adrenals lie pressed against and above the renal glands, or kidneys. We all know that the kidneys are the laboratories where the chemists who filter the blood, keeping Jack's water-supply pure, are constantly at work.

Only a short time ago we believed that these laboratories were practically just automatic filters, like those we are accustomed to use for keeping the water-supply of our houses pure. But we know better now, for we have discovered that not only are the cells of the kidneys alive, but they are wise and skilful, and the work done by the kidneys is living work, not mechanical. The kidneys are laboratories, containing clever living chemists, upon whose good work Jack's happiness depends. If these chemists are not working well, Jack is "not quite himself," as we say.

**THE TINY CHEMISTS WHO MUST NOT BE OVERWORKED**

People might say that it does not much matter which way we look at all this. But if you think a minute you will see that it does matter, right thinking always does matter in the long run. If the kidneys were nothing but a sort of grating or sieve, we need not fear as to their behavior; but if they contain living chemists, then those chemists can be overworked, like anyone else, and if they are too long overworked they will get weary and become ill, just as any other living thing would. In time they will not be able to work at all. A few years ago doctors used freely to give as medicines all sorts of things which were known to make the kidneys work harder—thinking this only meant that the blood would be filtered through them more quickly than usual.

But now we know it means that the tiny precious chemists will be overworked; and the new rule is to give nothing to add to their work when they are in difficulties, but to simplify what Jack eats and what Jack does, and so lighten the work of the chemists until they can recover. This means giving far fewer medicines, which is what the best doctors are doing nowadays. And the same is true of every day, for people are learning that if they overeat they are overworking the chemists in their kidneys who deal with all rubbish.

### THE LARGEST LABORATORY

Many times bigger than both the kidneys and both the adrenals put together is the largest laboratory in Jack's house, called his liver. We all know that our happiness and health largely depend on the faithful and skilful chemists in this laboratory, and somebody who was asked: "Is life worth living?" gave an excellent answer with a double meaning: "It depends on the liver." Now, this laboratory is in many ways unlike any other. In the first place, it is huge compared with the others. Its business requires it to deal with all the blood in Jack's body, and to do so at a great rate. All the millions of millions of cells, or chemists, that make it up appear to be exactly the same, and to do the same work if there is need, and from one point of view they are by far the cleverest cells anywhere in the body, because all of them can do so many different things.

For instance, they store up iron for Jack's use, and fat for him to burn as fuel, so that this laboratory is also a larder, a filter, and a fireplace too, as we shall see. They catch or filter and melt down the old red cells of his blood, which are the porters, each carrying a little portion of air for ventilating Jack's house.

### THE GREAT FIREPLACE IN JACK'S HOUSE

In this and various other ways the liver cells produce a stuff called bile, which has all sorts of uses, *in its place*, but is very undesirable when it gets into the blood, for then it makes Jack bilious—that is, bile-full—and unhappy, and bad-tempered, and yellow-eyed. However, when we have said all this and much more about what the liver

does with the blood, we have left out the most important of its duties.

The adrenals contain the chemists who just make a few drops of something powerful and precious. The kidneys contain the careful and discriminating chemists who pounce upon bad things in the blood, and filter them away. The liver contains chemists who pounce upon the bad things in the food, and burn them up. Note that the burning up serves two purposes—a very common trick in Jack's house. It destroys dangerous things, and it keeps Jack's house warm.

But now as to the poisons in Jack's food. The liver is so placed that all the blood running from Jack's bowel, with the food it has picked up there, must pass through the liver before it reaches Jack's great central pump—the heart, from which it is pumped to every part of Jack's house, and especially to Jack himself. None of Jack's other laboratories are in such a position as this; only this huge one is placed on the line of route, so that every speck of food, however well cooked, except only the fat or oil that is to be used by Jack, must pass the test of the chemists in the liver.

### THE SENTINELS WHO GUARD THE WAY TO JACK'S LIVING-ROOMS

Now, the liver may be called the great gate, or portal, inside Jack's house, through which everything must pass before it is admitted to the master's apartments. There are houses in many parts of the world built round a courtyard; and things may drive into the courtyard and be in the house and yet not actually in the house. Now, that is the case with the stomach and the bowel, and with the great gateway, with its chemist-sentinels and furnaces, which is always guarding the way to the master's living-rooms. Thus the proper name for this gateway, or portal, is the *portal system*.

Without it Jack would be at once overcome and killed by the poisons in his food. No matter how clever the hall-porter is, no matter what the teeth may do, no matter how clever the cooks who work Jack's ovens, quantities of subtle poisons pass into the blood from the food, and would overpower Jack in a very short time if it were not for the fiery test they have to pass in his portal

system. But there the liver-chemists stand, and throw into the fire all that they can of the unsuitable or dangerous stuff I brought to them by the blood. We find also that the same is true here as of the kidneys. We can overwork these faithful and unflinching chemists. They will go on till they drop.

But the time perhaps will come when these chemists are overcome; sometimes because of some powerful poison which kills them on the spot. But usually it is just a slow wearing out, due to excess of work with too little time for rest—and this is most likely to come when Jack himself is taking too much rest and doing little work!

That is what happens when people steadily eat too much, especially of rich, heavy, highly-flavored, unnatural foods, crammed with poisons—especially those people who do little or no muscular work and take none of the exercise which is so bracing to the liver-chemists. For a time all goes well, and we see no harm, for Jack's own rooms are not penetrated, and the chemists stick to their work and give no sign. But the time comes when these faithful servants fail to do their tasks, and then Jack's end is near, for he can neither do without them nor find others to do their work.

#### WHY NATURE MEANT JACK TO BE A TEETOTALLER

The commonest injury done to the liver is by alcohol, as everybody knows; but it is only within the last ten years that we have learned why alcohol does so much more harm than many other things which the liver seems able to deal with easily. The fact is that alcohol, being an entirely unnatural thing in the food, puzzles the liver. The chemists can make little of it, and what they do, when it reaches them, is to send back again in the bile as much of it as they can, while some of what is left slips through their hands and gets into Jack's private rooms. When the bowel gets the alcohol again, it quickly sends it back to the liver; and we now know that this may go on for days, and all the time, of course, the bowel and the liver are being injured. Several other poisons do the same thing as alcohol, getting on to a circular route from which they can only leak away with difficulty; but of all poisons not naturally occurring in the

food, and thus not naturally prepared for in the body, alcohol is, of course, the commonest.

Quite as much might be said about the *pancreas* as about any of these other laboratories. It is a wonderful gland, for it has two kinds of chemist-cells, one kind making a fluid which runs through a tube to the bowel, where it performs very useful work; and another kind—far fewer in number—behaving like the adrenal chemists, and giving to the blood some mysterious product which enables Jack's furnaces to burn up the sugar in the food.

#### THE BRAIN OF THE KITCHEN OF JACK'S HOUSE

Then there is the great telephone exchange, lying behind the stomach, which specially controls the whole of Jack's basement, and is in a large measure independent of the three exchanges in his top story, of which we have already told you. This exchange is often called the brain of this part of Jack's house, so important is it.

We know what Jack's stomach is for, and how it receives food and drink from Jack's front door by means of his "red lane," and how it sends on the food, partly cooked and digested, to the bowel, a tube many feet long, which the blood visits, and from which it carries the food away to the liver. Some of the food can not be used, and is left in the bowel, and the liver sends a messenger to move this and other rubbish along and also to kill any bad microbes which have slipped into his house.

#### THE WONDER THAT CAN NEVER BE TOLD

The stomach and the bowel are studded everywhere with wonder. The stomach has millions of skilful chemists, who are also cooks. Too many cooks do not spoil the broth in this case, for Jack has billions of them in all. The cooking done outside Jack's house is only the beginning; and there is no kitchen in the world to approach Jack's, and there are no waiters like the white cells of the blood.

Such are a few of the wonders of Jack's ground floor. Not a thousandth part of what the wise men know has here been told to you; what we know is not a thousandth part of the whole, nor could the whole ever be told.

CONTINUED ON PAGE 6107.

## The Book of STORIES



### THE FIRST MEN IN ENGLAND A TALE OF THE DAYS OF LONG AGO

SWAR was the first baby ever born in the land now known as England. His father, Wawa, was the leader of a tribe of savages living across the river which divided the country from what is now France. There was no English Channel in those days, but only a broad, deep stream running between low banks of chalky ground. Wawa had often swum across it, and returned home with a string of rabbits hanging from his shoulders; for food was growing scarce in France, and the green jungle on the English side of the river was full of game.

One bitter winter, when the tribe was starving, Wawa crossed the river and returned with a young fat deer. It was then that the tribesmen, after some discussion, decided to move to the other side of the stream. At first many of the women refused to go.

"The river is too deep and swift," said Bina, the wife of Wawa. "The children will either be drowned or killed by the wicked loughorns."

By the loughorns she meant the fierce rhinoceroses which then lived in English waters. For England at that time was very different from what it is now. The land was a wild

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green jungle, haunted by stealthy and terrible lions, and great bears, and fierce wolves. Reindeer, horses, sheep, and oxen roamed in wild herds in the open places, and now and then a troop of hairy elephants came crashing through the forest. In the reedy rivers herds of gigantic animals snorted and splashed.

"There is no danger," said Wawa. "The men can easily swim with the children on their backs, and you women can carry the tent-skins." "And who will carry the fire?" said Bina.

To this question Wawa could not find an answer. It was clear that the tribe must carry their fire with them. Few savages in those days knew how to make fire quickly, either by striking sparks from a flint or by twirling a stick of hard wood in a hole made in softer wood. Most of the tribes got their fire from volcanoes and burning forests, or from some race who had already obtained a tribal fire from these natural sources. Sometimes they had to go far to find it, especially in winter time, but never before had they been forced to carry it across a stretch of water.

Time after time he made a great torch of firwood, and tried to swim the river so that he could light a fire with it on the other bank ; but the torch always went out before he reached the shore. At last, as winter was changing to spring, he thought out a plan.

"We must make a large raft," he

a small hole in the trunks of the trees, and in these holes kept fires lighted until the bottoms of the trees were nearly burnt through. Then one wild night a storm of wind came and sent the oak-trees crashing to the earth.

The tribe danced around the fallen trees, and feasted far into the night. It



The tribesmen, after some discussion, decided to move to the other side of the stream.

said, "large enough for us to carry fire on."

He chose three great oak-trees, and the tribe set about felling them. The only tools the tribesmen had were rough, blunt stones fixed into cleft sticks. With these flint axes it was impossible to cut down a great tree. So Wawa thought of another plan. The fire should help them to build rafts to carry itself across the water ; he hollowed out

was the first time they had been able to fell great forest trees, and the sense of a new power filled them with pride. Everybody was now eager to cross the great river and settle in the new land where food was plentiful.

It took six weeks for the tribe to make a raft capable of carrying their precious fire, and their little babies, and the skins they used for tents. Axe after axe was broken in lopping off the large boughs.

The women took the blunted flints and sharpened them. They worked in pairs. One held the flint in both hands on an anvil-stone; the other woman sat on the other side of the anvil and struck rough flakes off the flint with a stone punch and a stone hammer.

Their work was rough, and their tools were little better than sharp flints found by the roadside, yet they were human tools, and with them they got the wood for the raft ready by the middle of April. This was a good time to start, for roots were pushing up in the woods, and birds were coming back from the south. There would be food, and soon there would be shelter. They had no nails to join their raft, but they fastened the larger pieces together with long strips of reindeer skin, and bound the smaller sticks with willow twigs. Then they lined the middle of the raft with clay, and when this was dry they lighted a fire on it, and, with long poles, steered their flaming vessel across the stream. They were nearly overturned by a rhinoceros, but the smoke blew into the face of the monster and frightened him off.

"Ho, ho, ho!" shouted Wawa, as he moored the raft by the English bank. "That's the first time old Loughorn has seen a fire on this water, and he doesn't like it at all. Ho! ho! ho!"

The men made a clearing on some high ground by the river, and put their fire in the centre of it. Then they brought their babies and tent-skins across on the raft, and the older children and the women merrily swam after them, and

began to busy themselves with setting up the first village in England. Four rough stakes were fixed in the ground, four poles were lashed to their tops, and over this structure the skins were hung.

"How many tents shall we put up?" said some of the tribesmen to their chief.

"One man," replied Wawa.

By this he meant twenty huts. The tribe were not good at figures. They had words only for the first four numbers—one, two, three, four. For five they said a hand; for six, a hand and one; for ten, two hands; for fifteen, two hands and a foot—that is to say, ten fingers and five toes; for twenty they said a man, which was a short way of saying ten fingers and ten toes. If you had asked Wawa what was the number of men and women and children in his tribe, he would have replied, "Three men, two hands, and three."

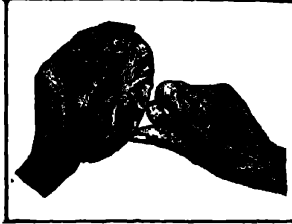
I will leave you to make out how many that comes to by our way of reckoning. The next morning, however, there were three men, two hands, and four

in Wawa's new village. For in the night a little baby boy was born to Bina. He was a funny little creature, and he came into the world lightly covered with fine, soft hair.

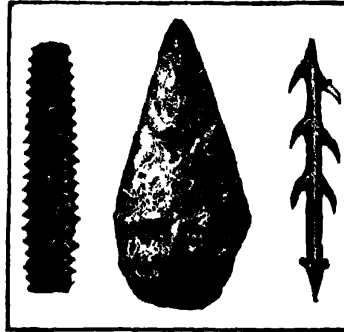
"How pretty he is!" said his mother. "Let us call him the Fawn."

"No, no," cried Wawa; "if we do so he will grow up as timid as a deer. He shall be called the Lion."

Now, the lion, in their language, was called the "Swar." And that was how the first baby that was ever born in England came to be known as "Swar."



How the tools were made.



The weapons they used.

## THE FIRST BOY IN LONDON

### HOW SWAR PLAYED WITH THE CAVE LION

SWAR was about five years old when he came to London. It was a very strange place in those days. The Thames was much deeper and wider than it is now. A great part of the valley between the heights of Hampstead and the hills of Surrey was under water,

and the rest was a trackless jungle swamp. Here and there, on patches of rising ground, grew large fig-trees laden with ripe fruit, and there were tall laurels, towering planes, and hundreds of strange plants and lovely flowers which flourish in warm countries.

Monkeys chattered in the forest; herds of elephants and wild horses and wild cattle roamed in the prairies. In the river were fierce, huge water-beasts, like the rhinoceros and the hippopotamus; and panthers and leopards and striped hyenas crouched by the river-edge.

"Here we will plant our tents," said Wawa, the father of Swar and the chief of the tribe, leading his people to the spot where St. Paul's Cathedral now stands. "The great water will protect us on the south," he said, pointing to the Thames. "And these streams will guard us on the sunrise and the sunset," he continued, turning to Walbrook on the east and Fleet River on the west.

On the north was a swampy marsh, and here the tribe built a great fire, and kept it burning night and day to scare wild animals away from their camp.

"Be very careful, Bina," said Wawa to his wife, "that Swar does not toddle beyond the fire. Women and children must hide in camp until the hunters have cleared the swamp of great beasts."

"How tired I am of it all!" exclaimed Bina. "Ever since Swar was born we have been kept moving farther and farther north. Shall we never settle down quietly in some place where the children can walk about in safety?"

"Yes, little woman," said Wawa, with a smile. "Now I have come to this great new river, where game and fish and beavers are so abundant, I will cease from wandering, and settle here. Look! Here is the pelt of a lion's cub I killed this afternoon in the swamp. You can make Swar a fine dress of it. Then he will be a little Swar indeed."

Swar was the tribesmen's word for "lion," and it was given to the little boy so that he might become as brave and mighty as the king of the jungle. Bina was much pleased with the cub's skin, as her child had torn his beaver dress to pieces. Without waiting to cure the pelt, she quickly scraped it and tied it round Swar, who was eager to show himself to his playmates in his new and glorious attire.

"I'm a lion—a terrible lion!" he shouted gleefully, running among the other children.

He ran about on all fours, trying his best to roar in a voice of thunder, and his companions pretended to be very frightened, and then they got some

sticks, which they made believe were spears, and with these they began to hunt the lion.

Swar was at a disadvantage, as, in order to play the game, he had to crawl about on his hands and feet. At length, pressed by the hunters, he crept down the bank of the Fleet River, and tried to find some hole into which he could retreat.

"Daddy says that the cave lion always goes into its cave when it is badly wounded," said Swar to himself, as he clambered down to the water-edge, and then stole out into the swamp. This was a delicious place to hide in. Tall grasses higher than his head waved in the wind. Clumps of dense bushes with stiff forked branches that he might crouch in rose everywhere. He crawled in thick deep moss.

By this time he had got quite away from his companions. He could hear them calling in the distance to each other, but none of them dared to leave the camp. Swar hid in a clump of bulrushes, vainly waiting for his playmates to come and discover him.

It was not until it was growing dark that he came out, and then he was frightened by the silence and the loneliness and the strangeness of the jungle in which he had hidden. It was too dim for him to see his way, and in trying to get back to the camp he walked farther out into the marsh.

Suddenly a lion roared quite close to him. He cried out in terror, and a huge form crashed through the underwood and pounced upon him, and then stood over him, whining curiously, and licking him and smelling him. It was the lioness whose cub Wawa had killed. "The poor huge beast knew the smell of the skin that Swar wore, and thinking that he was her cub, she picked him up gently in her mouth and trotted off with him, purring as a cat does when it is pleased.

All that night Wawa and Bina and the men and women of the tribe wandered by the Fleet and the Thames and the Walbrook, searching for Swar. At break of day the father found the trail of his little son, and quickly traced it through the swamp to the clump of bulrushes. There he caught sight of the print of the feet of the lioness, and he cried aloud with woe, and fell down weeping.

Very slowly he went back to his tent, and took out his heaviest club—a great stone thing weighing a quarter of a hundredweight—and called to all his men to bring out their hunting spears and follow him.

"Are you going to find Swar?" said Bina. "Have you found his trail?"

"Yes," said Wawa slowly. "I have found his trail."

He could not bring himself to tell his wife what he had found besides, but hurried off with his men on the spoor of the lioness. "I killed her cub; she has killed my child," he thought to himself. "I will take care that she shall not kill anything else."

He traced the spoor of the huge beast across the swamp to a cavern on the southern slope of Primrose Hill.

"Wait till I call," he whispered to his men. And very warily and very gradually he crept up between the dense jungle growth to the mouth of the cave. Happily, the wind was northerly, so his scent was not blown towards the beast's den. He got within fifteen paces of the cave, and then peered through the leaves.

Had he been less surprised at what he saw, he would have leaped up and shouted. As it was, he kept utterly motionless with wonder, having grasped the situation. The lioness was lying down just outside the cavern, and Swar was sitting quite happily between her huge paws and merrily playing with her.

He pulled her wooly fur, and she sat blinking at him with her large yellow eyes. Then he tried to clamber up her huge back, but rolled down, and seized

her long tail, saying, "If you won't take me back to the camp, I'll run away." The lioness still blinked lazily at him, and in the light of the rising sun her yellow eyes looked like jewels. Swar made a playful jump at them, and ended by claspings his little arms around the dread beast's neck. Then he started to toddle off, but the lioness arose and gently took him in her mouth and sat down again by the cavern, and dropped him on her paws, and purred over him and patted him lovingly.

"She thinks he is the cub she lost, and she is afraid to let him go from the cave," said Wawa. "She smells the cub's skin around him, and that saves him."

The chief crept back to his men, and told them to return to the camp.

"One man now," he said, "is better than many. There will be less danger of her scenting anything strange when she leaves her den in search of some food."

Happily, the great beast was very hungry, as she had not done any hunting while seeking for her cub. A little before noon she got

up and shook herself, and disappeared in the jungle in search of food. This was Wawa's opportunity to recover his little boy.

"Swar! Swar!" said Wawa to his boy, who was sitting on the ground.

Swar ran forward with a cry of joy, and Wawa lifted him on his shoulder, and tore with him through the thick jungle.

That night the chief had a line of fires lighted all along the northern side of the camp, and the lioness howled behind them for her little human cub but dared not enter the camp. But Swar slept soundly in his mother's arms.



THE TRIBE BUILT A FIRE



## THE TALE OF A SLAVE

IF ever you go to Algiers you will hear the name of Geronimo, and this is the story they will tell you.

Geronimo was an Arab, a native of Algeria, where he was born in the middle of the sixteenth century. He was taken captive during an expedition made by the Spanish garrison of Oran, and was baptized into the Christian faith. When he was eight years old, however, he managed to escape and rejoin his friends. Persuaded by them, he then renounced his new religion and became once more a Mohammedan. But the teaching he had received during his captivity had made a deep impression upon him. He returned to the Spanish garrison, and became a Christian.

Some time afterwards, however, when out in a boat, he fell once more into the hands of enemies, this time a band of Moorish pirates, who carried him to Algiers and sold him as a slave in the market-place of his native city.

Now, when he and his fellow-captives were standing in the slave-market wondering whether they would have kind masters or cruel, Geronimo was singled out on account of his manly bearing by an agent of the Governor of the city, who paid the price demanded. His master proved to be a stern and cruel Mohammedan, who demanded that he should give up his faith. Those who accept this religion think that they commit sin if they do not try to make all around them accept it also, and will go to any lengths to carry out their purpose. Moreover, he did not consider that a slave had any rights aside from his master. He bade his overseer see to it that the new servant turned from his former beliefs.

This, however, Geronimo firmly refused to do. His master became infuriated, and treated him with great brutality. When he found that this had no effect, he offered him great rewards and even liberty itself if he would do as he wished. But Geronimo remained steadfast.

About that time a new fort was being built and Geronimo, with other laborers, was working there. Part of their duty was to make huge blocks of cement, for the walls of the fort. The process was this: the cement was mixed in great quantities, much as it is to-day, and then shoveled into big wooden boxes. When

it had set, the boxes were removed, and the solid masses were carried away and placed in position.

One day, as the Governor strode among his workmen his eye fell on Geronimo. It occurred to him that a terrible instrument lay ready to his hand. He would give his slave another chance of renouncing his religion, and if he refused he should be buried alive in one of those boxes of cement.

Geronimo was brought forward and given his choice. He refused. The Governor, beside himself with fury, ordered the brave fellow's hands and feet to be bound, and the cruel sentence was carried into execution. The great block of concrete, with the heroic slave imprisoned inside, was placed in the wall of the fort. Geronimo was calm and brave to the end. As the deed was finished, the Governor, who, perhaps, had hoped in his heart that Geronimo would not hold out, was heard to exclaim: "I never thought that dog of a Christian would die with so much courage."

The event reached the ears of one of Geronimo's old friends, a Spanish monk, named Haedo, who wrote it down. This was in the year 1569. Nearly three hundred years after, in 1853, it was found necessary to destroy the fort, and the man in charge of the work determined to see if the story of Geronimo were true. After much patient digging and searching his labors were successful, for on December 27 in that year he discovered the martyr's remains enclosed in the masonry as had been described by the old monk three hundred years before.

The bones were carefully removed and interred with much pomp in the Cathedral of St. Philippe, where they rest to this day, in a marble tomb.

As a further memorial of Geronimo's splendid fidelity and courage, liquid plaster of Paris was run into the mold formed by his body in the concrete wall, and a perfect model, showing not only his features, but also the cords that bound him, and even the texture of his clothing, was produced. This now lies in the Government Museum at Algiers, and that is why, if you go there, you will hear the story of Geronimo.

## THE FARMER AND THE RAVEN

A MAN caught a raven, and, after a great deal of trouble, he managed to teach it to say, "Of course I am." He then took it to a neighboring town, and offered it for sale in the market-place.

By-and-by two farmers came, and one of them asked the price of the bird.

"Ten pounds," said the owner.

"That's a lot of money," remarked the farmer to his friend. "Do you think it worth so much?"

Before the other farmer could reply, the bird croaked hoarsely, "Of course I am."

This apparent cleverness so pleased the farmer that he paid the money and carried off the raven.

When he got home, he said to his wife:

"See, I have brought you a present."

"Oh, thank you!" said the wife. "He is a very pretty fellow."

Promptly the raven exclaimed, "Of course I am."

The woman was greatly pleased. "He is as sensible as a human being," she said, and the raven answered solemnly, "Of course I am."

The farmer and his wife were quite delighted, and looked forward to having much amusement from so clever a bird. Their hopes, however, were doomed to disappointment, for the raven never spoke but the one phrase. Many a time did the farmer wish he had not parted with his money so thoughtlessly. At length he exclaimed in anger:

"That bird is a regular swindle."

The raven stretched out his neck and croaked dismally, "Of course I am."

"Try before you buy, next time," said the farmer's wife.

## THE SON WHO RETURNED HOME

IN Japan, many years ago, a son who lived a very bad life brought great disgrace on his parents, who, nevertheless, loved him dearly. But their relatives persuaded them that it was their duty to disinherit so bad a son, and it was arranged that, according to custom, a meeting of the relatives should be held, to go through the ceremony of disinheriting.

The son heard of this, and, speaking mockingly of his parents before his bad companions, he declared that he would suddenly rush into the meeting, and, swaggering like a brigand, demand a large sum of money before they should get rid of him. His friends encouraged the plan, and made much of him. They were overjoyed to think that they could share in the spending of the money. Afterwards, when it was all gone, they would leave the bad son to go his way alone.

When he came to the house he peeped

through a hole in the door, and saw the family sitting in a circle. The disinheriting document was handed to the father for his seal, but, with tears in his eyes, the father hesitated.

"After all," said he, "my son may get better."

"Yes," said the mother. "Let us wait a little longer, and see if he will turn."

The relatives urged them to affix their seals; but again the parents hesitated, and, with tears in their eyes, spoke of the possibility of their son giving up his evil ways.

The relatives began to get annoyed, but still the father would not put his seal to the document. The son, who was listening, felt a new sensation come over him. He was touched by the love of his parents, and, bursting into the room, he craved their forgiveness, and from that moment he forsook his bad companions, and gave up his evil ways.

## THE STONE THAT GATHERED NO MOSS

A BOY came home from school one day, and said to his mother: "The teacher told me this morning that it was not worth my while coming to school any more, as I seemed to have nothing more to learn, so I shall go no more."

"Very well, my son," replied the mother, "if you have done with school, you must go to work. I know of a tinker who is in want of a boy; you shall go and work for him."

The boy was delighted, and accordingly

set out next morning to learn the trade of a tinker. It was summer-time, and for a while he was quite happy roaming about the country with his master, grinding knives and scissors. But winter came, with ice and snow, and he found that the life of a tinker was not all he had thought it. So he decided to look for other work.

A few days later, as he was passing along a street, he saw a tailor sitting in a shop window stitching away. "That is the sort of work I should like," he thought. "I will become a tailor." So he left his master and started to learn how to cut cloth and make clothes. For a little while all went well.

"I am indeed fortunate to have got work so much to my liking," he thought. "I shall suffer no more from the bitter winds or driving storms of rain and snow. No more cold hands and tired feet for me. Think of picking up good dry cloth instead of wet cold knives and scissors which always sent a shiver down my spine. Instead of trudging along the roads for hours at a time, I shall have nothing to do but sit in a warm room and stitch from morning to night."

Once more he became discontented. Not all at once, of course, for discontent never comes like that, but one little thing was unpleasant, then something else became disagreeable, till before very long he was as unhappy and enduring as many miseries as he had already escaped from.

"It's all very well to be a tailor in the winter-time," he said to himself, "though sitting still on a hard board hour after hour makes one's limbs ache so that it is nearly impossible to stand; but in the hot summer days it is really cruel to expect me to remain at work indoors with the heat from the irons. No, I can't

stand it any longer. I must get other work."

That afternoon there came down the street a regiment of soldiers. How brave they looked in their trim uniforms!

"There is some pleasure in a life like that," thought the boy. And then and there he decided to become a soldier.

Very soon he found out that he had made a mistake. A soldier's life was far different from what he had imagined. There was heavy drill and constant work. The flashing swords, the spirited horses, and the smart uniforms had all to be kept in order. It was not the easy life of



The boy decided to look for other work

grandeur and glory he had pictured, but one of endurance and effort. Sometimes when he was quite worn out with the exertions of the day he had to mount guard instead of having the sleep and supper he longed for. To make matters worse, he could not give up his work the moment he grew tired of it, as he had done before. He was bound to serve his country for three years, and, whether he liked it or not, had to obey those who were over him and make the best of the position his foolishness had

brought him to. At length his period of service came to an end, and he took his discharge. He made up his mind to visit his native village. On the way he heard of a farmer who wanted an extra hand to help with the harvest so he made his way to the farmhouse, saw the farmer, and asked for the post.

The farmer asked him what kind of work he could do.

"I can turn my hand to almost anything. I have been a tinker and a tailor and a soldier."

"Ah," said the farmer, "I am afraid you are not the sort of man I want. I am looking for a man who is not afraid of work. If you had had any idea of

working for your living, you would not have tried so many trades. You would be of no use on the farm."

And so the young man went here and there, but wherever he went it was the

same story, no one wanted to employ a man who had done a little of everything but had learnt nothing well. And all his life he had difficulty in earning sufficient to keep himself.

## HOW THE CHILDREN SAVED THE BEARS

"THEY'VE come!" said Wandy, sitting on the log beside Tiki-tiki.

"Two red-faced men from town, come for 'scientific research,' with their horrid legs all strapped up in leather! They've pulled out their guns already, and they're all looking at them and talking, inside"

—she nodded towards the homestead —

"daddy, too, and Alan;

and once he wouldn't have

shot a bunny, even if it had

eaten up his prize lettuce!

When they've had some tea,

the men from town are going

straight off to get Australian

specimens. They want a

native bear, alive, 'cos the

law says they must not be

killed; but if it dies it can't be helped.

It'll do stuffed! Isn't it awful?"

"Isn't it dreadful?" echoed Tiki-tiki gravely.

"And daddy says *we* are to show them where the bears are, 'cos no one else knows. What shall we do?"

The children looked at each other with round eyes of horror.

"What shall we do?" asked Tiki-tiki.

"We can't tell them *wrong*," said Wandy. "'cos *that* would be fibs. I know" — she mused slowly — "we might show them where the bears are *when they're there*. Let's tell them where the bears live when they're at

home, and, while we go through the bush, warn them not to be in to-day!"

"What a good plan!" said Tiki-tiki. "And when we've passed the bears' home, we might *lose* the men a bit for

cruelty to animals — especially *our* animals."

In due time Wandy and

Tiki-tiki set off for the

bush, as the country is

called in Australia. With

them were the two scientists,

a dog, two guns, and two

wallets full of cartridges.

The scientists found the children

charming comrades, full of in-

structive chatter about their

little bush brothers and sisters, as

they called the wild creatures of the forest.

"Wandy means little woman," said Tiki-tiki. "It's aborigine talk. My name's Little Brother, and the baby bears are koalas. These are our bush names."

But he did not tell that Wandy and he could speak the fairy language. *That* might have given a clue to show the scientists what they were doing to save the baby bears, and they perhaps would be sent home again. Daddy would be angry if they were not polite to his guests, but friends come first, and the bears were such good fun.

The two little blue smocks sped on as fast as four short legs could go. The



The children warned the bears to say nothing.

scientists, though vastly interested in all they learned about bush creatures' ways, thought it a long, long walk to the bears' home. Under the blue smocks Wandy's and Tiki-tiki's hearts were beating time to their legs. For the children were afraid the bears might be sleeping up in the tall gum-trees, and never hear the warning.

It was in fairy talk that Wandy and Tiki-tiki warned the bears to lie low and say nothing. All the time they were passing under the gum-trees they trampled hard on the bracken and twigs and bark, and asked the two scientists if they would please stamp hard too, so as to scare away the snakes! So the bracken and twigs and bark were all the time crick-cricking a message on wireless fairy telegraph batteries. Then the locusts on their watch-towers in the branches took the message, and sent it from tree to tree, wherever there were bears; and the message said:

"Danger! Scoot! Love—From Wandy and Tiki-tiki."

But the wise gum-trees that stretch their protecting arms above all the innocent bush folk swayed anxiously, and sighed a wireless question back to the children: "How about the doo-doo? Will not *he* scent out the bears?" Doo-doo is the word for dog.

So Wandy rustled her hand caressingly through some gum-leaves to say: No! For Tiki-tiki has a nice little bit of raw steak in his pocket, and the doo-doo will

follow him, and not bother about any other trail."

By this time the scientists were hot and cross and tired, and sat down in the shade to rest. Perhaps the smell of the gum and eucalyptus trees floating on the warm air made them sleepy. But Wandy and Tiki-tiki went straight ahead, and never once looked back; and the doo-doo followed Tiki-tiki, nuzzling at his pocket.

When the scientists thought it time to move, they looked round for Wandy and Tiki-tiki; but all they could see far away in the scrub was two blue smocks fast

vanishing out of sight, and a gleam of golden hair, and a little round, dark, bobbing head.

"Coo—ee! Wait a bit!" they called.

Such a dance as Wandy and Tiki-tiki led those two scientists you could never think. In and out among the trees, over logs down gullies and across creeks with the kooka-bur, as as they call the laughing jackasses in the bush, laughing all the time. When the scientists got near enough to clutch the children,

they were off again; and, indeed, if the scientists had not been so very scientific, they could almost have fancied they followed a fairy and an imp instead of a real little girl and boy.

In a little glade, deep in the heart of the bush, the scientists thought they had at last overtaken the children, but they rubbed their eyes when the blue smocks turned out to be two little blue



Such a dance Wandy and Tiki-tiki led the scientists.



The goblin kooka-burras laugh at sunrise.

gum-trees swaying in the wind, and the gold hair was a sunbeam, and the little dark head a bobbing shadow.

The scientists, who had often boasted of their skill as bushmen, found, to their disgust, that they were hopelessly outwitted. Then the mosquitoes found them out, and *they* were more irritating than even Wandy and Tiki-tiki. And those goblin kooka-burras, who always laugh at sunrise and sunset, and so are called the bushman's clock, were saying quite plainly: "Lock-up time in the bush! All trespassers out!"

Meanwhile, Wandy and Tiki-tiki, followed by the doo-doo, marched right on for home, and when they reached the slip-rails of the home paddock it was quite dark.

Indoors daddy and Alan were waiting for the scientists, anxious to see the day's bag, but mother was eager to have Wandy and Tiki-tiki safe in her arms again.

Of course, everyone understood that the scientific guests had waited behind to make the most of the last hour of daylight, which is the best time for sport, for at dusk all the shy creatures venture abroad.

Ten o'clock struck, but, though there was a bright moon, no scientific friends appeared, and the doo-doo was whiming uneasily. So a search-party had to go—daddy, and Alan, and the gardener, and even an old tramp who was camping at the homestead for the night.

Strange to tell, the doo-doo was now quite ready to leave Tiki-tiki, and joyously bounded ahead with Alan, and was not long in following up the trail and finding his lost masters, who were really quite angry, though, as visitors

in a strange house, they had to pretend that it was a good joke. They cheered up a little while they were eating the hot supper mother had kept for them, and the doo-doo was being fed by Wandy and Tiki-tiki, who had been allowed to stay up late to see if the wanderers reached home in safety.

After supper, sitting round the big cosy wood fire, people began to ask questions.

"Queer you had such poor sport to-day," said daddy. "The children have never failed before to run across some native bears. Very queer!"

"Yes," said one scientist. "But more remarkable still that my dog deserted me for your little boy. He has never done that before."

Then the other scientist began to wonder why Wandy and Tiki-tiki had not waited when he coo-ceed.

"Why didn't you keep up to us? It was not the time to sleep then, for if the bears had already seen or even heard us, it gave them time to hide away. *They* only sleep when they have nothing else to do, or when it is cold," said Wandy, looking at them gravely.

Of course scientists ought to know this, and so the man stopped asking questions. They went back to town next day. They had had enough of the bush—no sport, too little scientific research, and too much of Wandy and Tiki-tiki. They have written in their scientific notebooks that there are very few animals in that part of Australia.

So this was how two little Australians saved the baby bears, and they mean to do the same every time people go out to harm their brothers and sisters of the bush.

## TALES TOLD IN A MINUTE

### SAVING FIVE HUNDRED YEARS

A JAPANESE boy caught a tortoise, which is known to live hundreds of years.

"A fish for dinner will do just as well," said he. "I will not cut short its long life of five hundred years."

So he put the tortoise back in the sea.

### THE BREAD-WINNER

A father was working on a high scaffold with his son, when the scaffold broke, so that it was only able to support one.

"Good-bye, father," said the son; "you are the bread-winner. I will let go."

So the son died, and saved his father to support the home.

### SELLING THE SUN FOR A SOVEREIGN

A man once found a sovereign in the street, and for ever afterwards it was noticed that he looked on the ground as he walked along.

But he never found another sovereign, and in addition he never saw the sun.

## STORIES TOLD IN CHINESE SCHOOL-BOOKS

No lesson is more taught in China than that of respect for parents. This is enjoined as a religious observance, and has developed into the worship of ancestors. The story-books of the Chinese boys and girls are full of such stories of filial love as are given here.

### THE MAN WHO FOUND DEER'S MILK

THERE was a young man named Yen, who had a great love for his father and mother, both of whom were very feeble and nearly blind. The doctor who visited them declared that the only thing that could possibly do them good was deer's milk, but this was too costly for them to buy. In the dead of night Yen went away to the mountains and shot a wild deer with his bow and arrow. Then, stripping off the skin, he dressed in it, went among the herd, milked the deer, and brought the milk to his parents, thus saving their sight.

### THE BOY WHO SERVED HIS FATHER

WHEN little Hwang lost his mother, he determined more than ever to be a faithful and loving son to his father. It was the summer-time, and the father tossed about on his bed, unable to get any restful slumber owing to the great heat. Hwang crept to the bed, and, taking his little fan, stood over his father all night fanning him, so as to make him comfortable. This he continued to do all through the summer months. Then, when winter came, Hwang always lay upon his father's bed for an hour, to make it warm for him.

### THE FISH FROM THE LAKE

A LITTLE boy named Liang, who had lost his mother, had a stepmother who treated him roughly, and was always finding fault with him. But Liang did not let this draw him away from his duty, and he was always seeking to do some kind act for his stepmother. She was very fond of fish, but during a cold winter there were no fish to be had. So Liang went out at night on a frozen lake, and, lying at full length on the ice, he breathed upon it until a hole was melted, and then through this he drew two carp, and took them home for his stepmother's breakfast. A great poet who heard of Liang's action wrote a poem about it.

### THE BOY AND THE MOSQUITOES

THE parents of Wu Mang, who was only eight years old, were very poor, and could not afford curtains to

put round their bed to protect them from the mosquitoes. So directly his father and mother were asleep, Wu Mang went and lay down close to them, and when the mosquitoes settled upon him did not drive them away, but allowed them to bite him. In this way he drew all the mosquitoes away.

### THE OLD MAN WHO BECAME A CHILD

LAE was an old man of seventy, but all his life he had been a most dutiful son, and now that his parents were very old, he gave up his life to pleasing them. Their minds had become weak owing to their age, and they had forgotten how old they themselves were and that their son had become a man; they thought that he was still a little child. So, in order to give them pleasure, Lae dressed himself in gaily-colored garments and danced about like a boy, to the great delight of his father and mother, who clapped their hands and said: "What a bright little boy is our son! How happy he makes us as he gambols about in his childish innocence!"

Lae's limbs ached for a week afterwards, but he bore it patiently and even gladly, though it was hard at times not to walk stiffly before his parents.

### THE KIND SON WHO BECAME EMPEROR

YU SHUN was a very dutiful son, although his parents cared nothing for him. They loved his brothers, who were bad and idle men, but not handsome than Yu Shun. One day his father put him down a well, and his brothers threw stones at him, but he managed to climb out. Then they set fire to a granary when he was inside; his clothes caught fire, but again he escaped. All this time Yu Shun worked hard on the farm, fished in the river, and chopped down trees for fuel, so that everything necessary for the home was provided. At last the Emperor Yaon heard of his filial devotion, and chose him as husband for his daughter; later on the emperor resigned the throne in favor of Yu Shun.

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SHAKESPEARE

# The Book of MEN & WOMEN

MILTON



RAFAEL

HAY  
OLE  
ON



A winter scene at the birthplace of Robert Burns, as it was in the poet's lifetime.



BURNS

TEA  
WELL  
ON

## ENGLISH POETS SINCE MILTON



CR  
WELL

JUST four years before the death of John Milton, a younger poet of less noble character, though still to be reckoned among the great writers, was appointed Poet Laureate. His name was John Dryden, and he was born at the Rectory of Aldwinkle All Saints, in Northamptonshire, on August 9, 1631. Like Milton's, the parents of John Dryden were Puritans, but, unlike Milton, Dryden did not throughout his life remain faithful to the religion of his youth. Indeed, his character cannot altogether be admired, for a great part of his life was spent in supplying the theatres, that had reopened with the restoration of Charles II to the throne, with plays of so vulgar a nature that they could not possibly be performed in public to-day.



DRYDEN

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DRYDEN

CONTINUED FROM 5939



loving king took advantage of their new liberty by encouraging the most vulgar performances. It is to the shame of John Dryden, gifted as he was with splendid poetic powers, that he did not disdain to earn his living by pleasing the bad taste of his time. Thus we can never think of him with the personal admiration that we have for Milton, who only received a small sum for one of the noblest poems of all times, while Dryden was earning a good living by helping to lower public taste.



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We do not know much about the early life of Dryden, except that he was educated at Westminster School, under Doctor Busby, a famous headmaster, who, although noted for his powers in thrashing his pupils, was admired and respected by all who came under his discipline. As a schoolboy, Dryden was fond of writing verses, and, also, when he studied at Trinity College, Cambridge, he continued his poetic exercises; but he does not seem to have been a scholar of any particular note. He inherited a small income, not sufficient to support him, and shortly before his marriage with Lady Elizabeth Howard, the eldest daughter of the Earl of Berkshire, he turned to



DRYDEN

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JULIUS CAESAR



HERBERT SPENCER



writing for the newly-opened theatres as a means of support. On the whole, his plays, though frequently containing notable passages, are unworthy, and we have only to compare the best of them with the poorest of Shakespeare's to realize how very poor they are, although Dr. Samuel Johnson, one of the least trustworthy of critics, would seem to rank Dryden before Shakespeare.

**JOHN DRYDEN, THE POET LAUREATE  
WHO WAS A JACOBITE**

When James II, brother of Charles II, came to the throne, and England seemed likely to become a Roman Catholic nation, as the new king wished to impose that church on the country, Dryden also became a Roman Catholic. This is often mentioned to his discredit; but there is little doubt that the poet was not guilty of the meanness of changing his religion to curry favor with the new king. He had been tending for some years towards the Roman Catholic faith, and, later, when William and Mary were called to rule the land after James had fled, Dryden remained a faithful Catholic, thereby losing what he had previously gained in the way of royal favor.

One of his most beautiful poems, "The Hind and the Panther," is written in praise of the Roman Church, which he likens to the "milk-white hind, immortal and unchanged," the Church of England being the panther, "fairest creature of the spotted kind," while the other Protestant Churches are likened to other animals of different kinds.

**WHEN DRYDEN WAS AN OLD MAN AND  
POPE WAS A LITTLE BOY**

Dryden's great power took the shape of satire, and some of his finest verse is that in which he gives us biting pictures of historical personages. In his later years he adapted into English verse the works of the Latin poet Virgil, and, although these translations were well received, they do not give us a very good idea of the original, which is warm with all the sunshine and glowing beauty of Nature; whereas Dryden's verse is cold and glittering, like diamond-studded jewels. On May 1, 1700, Dryden died, and was buried in Westminster Abbey.

When Dryden was an old man, the most eminent literary figure of his day, there were people always keen to see him on his daily visit to a coffee-house where many men of note were in the habit of

meeting. It is said that one day, not very long before he died, the celebrated poet was pointed out to a little boy who had been brought there by a friend; and this pale-faced and delicate little fellow, when he grew up to be as famous as Dryden had been, never forgot this glimpse of his master. Already, as a boy of eleven, Alexander Pope was an intense admirer of Dryden's poetry, and had begun to write poetry himself, imitating Dryden's style. Despite his delicate health and stunted form, Pope was a marvelous student when only a child, and by the age of twelve he had written some quite remarkable poems, at least one of which, "On Solitude," might be taken for the work of a thoughtful man.

He was born in London, on May 21, 1688, his father being a wealthy linen-draper, who had joined the Roman Catholic Church, like Dryden, and who, in disgust at the new reign of William and Mary, had withdrawn to a house near Windsor Forest, where the early years of his son Alexander were spent.

**THE BOY OF SIXTEEN WHO RESOLVED  
TO BECOME A GREAT POET**

The boy received some instruction from priests, and other masters, but had no regular education, though his great thirst for learning, and the wonderful activity of his young mind, perhaps did more for him than the ordinary course of education would have done. He was extremely well read in the classic authors, and throughout his poetry we find him constantly making use of the ancient stories of the gods and heroes of Greece. He was only sixteen when he determined to be a poet, and before he was twenty-three years old, he had finished and published his famous "Essay on Criticism," a comparatively short poem, full of remarkable literary knowledge and ripe judgment. It contains many lines which are constantly quoted, such as "To err is human, to forgive divine" and "A little knowledge is a dangerous thing." This poem left no doubt that its young author was a genius.

Although, on the whole, Alexander Pope was not what we should call a lovable character, he was probably a better friend, and kindlier, than his poems would suggest, for, like Dryden, much of what he wrote was inspired by the unfriendly spirit of satire. He was the very opposite of a natural writer, every line

being of clearly artificial style, even when full of force and vigorous movement. Thus, he was peculiarly unfitted to translate the great Greek poems of the "Iliad" and the "Odyssey," of which we read on pages 73 and 74, which are full of the grand and solemn music of Nature; yet his translations of these books were so popular that he was paid \$40,000 for the work. Less than sixty years before, Milton had received two payments of \$25 for "Paradise Lost." If we were to reverse the two sums, we should be placing the proper values on the relative merits of the works; but, as we have said before, the best work is not always the most highly rewarded. This does not say, however, that Pope was overpaid for his work, but that Milton was inadequately rewarded for his.

With the money which he thus earned, Pope bought a beautiful villa on the bank of the River Thames at Twickenham. There, as the friend of most of the great men of his time, the rest of his life was passed, and other famous poems were written, chief of these being "The Dunciad," in which he satirizes all the lesser literary men who did not happen to be his friends. "The Essay on Man" was another of the notable works written at Twickenham.

If it is by no means a pleasant picture of the poet which we gather from his writings and the stories told about him, we have to bear in mind that all his life was spent in physical suffering. "When the poor little man got up in the morning," says one writer, "he had to be sewed into stiff canvas stays, without which he could not stand erect; his thin body was wrapped in fur and prunelle; and his meagre legs required three pairs of stockings to give them a respectable

look." On May 30, 1744, this strange little poet died, and was buried at Twickenham, where Pope's Villa is still one of the best-known houses.

The next of the great poets is one whose poetry is familiar to many young readers, and several examples of it are to be found in The Book of Poetry. William Cowper was born at Great Berkhamstead, in Hertfordshire, on November 15, 1731, and was thus a boy of about the same age at the death of Pope as Pope had been at the death of Dryden. But there was no likeness between the two poets, either in their characters or in their writings. Pope was almost entirely lacking

THE KIND-HEARTED POET AND HIS PET



William Cowper, the poet, was of a gentle and retiring nature, and was a great lover of animals. One of his pets was a tame hare, that lived for thirteen years, and at its death the poet wrote the "Epi-taph," given on page 2133.

in the gentle qualities of human affection, so far as his poetry is concerned, while this was the enduring note of everything that Cowper wrote. With Cowper the common domestic affections are for the first time in English made the almost continual theme of a great poet. He was of a gentle and quiet nature, loving all simple things, fond of animals, and full of reverence for the works of God, though equally capable of enjoying the untainted humor of simple life, as we read in his amusing ballad of "John Gilpin" on page 2657. He lacks the

splendid vigor of Milton, and also the powerful satire of Pope, but he reaches the hearts of simple people by his gentleness and pure humanity. His greatest work is called "The Task," because he undertook to write it at the suggestion of a lady, as a task set him. It is a beautifully natural description of everyday life and the changing seasons. Cowper's father was a clergyman. His mother died when he was about six years old, and shortly after he was sent to a boarding-school, where he led a very miserable life for two years before he was sent to

Westminster School. At eighteen, he entered a law-office, and when twenty-three he had qualified as a barrister. He did little or no legal work, however, but lived a quiet and pleasant life in the Temple, writing a little for the publications of the day. Some years later, a relative secured for him an important position in the House of Lords, but the poet was so shy of appearing in public, as this office required him to do, that another post was suggested for him. For this he had to pass an examination, in preparing for which he overtaxed his mind, and had, for a time, to be confined in an asylum.

#### THE SHADOW ON THE LIFE OF WILLIAM COWPER, THE GENTLE POET

A tendency to melancholy was the result of this mental disturbance, and for the rest of his life, though enjoying long periods of happiness, he lived under the shadow of the dread return of his malady, but he was fortunate in the tender love of friends, won to him by his gentle sweetness of nature.

Apart from his many and beautiful poems, Cowper was a most charming letter-writer, and from one of his letters we take a description of himself, "As for me," he writes, "I am a very smart youth of my years. I am not, indeed, grown gray so much as I am grown bald. No matter. There was more hair in the world than ever had the honor to belong to me. Accordingly, having just found enough to curl a little at my ears, and to intermingle with a little of my own that still hangs behind, I appear, if you see me in an afternoon, to have a very decent head-dress, not easily distinguished from my natural growth, which, being worn with a small bag and a black ribbon about my neck, continues to me the charms of my youth, even to the verge of age." At East Dereham, Norfolk, April 25, 1800, this sweet singer, but afflicted man, passed to his rest.

The next great poet in the order of birth had died four years before Cowper, although he had been born twenty-eight years later. The name of Robert Burns has a more universal fame than that of his older contemporary, whom, as a man, he resembled in no way, but whom he outshone as a poet, by reason of a wider range of feeling and a still greater sweetness of song, which at the same time is stronger than that of Cowper.

#### THE SCOTTISH FARMER'S SON WHO BECAME A WORLD-FAMOUS POET

The story of Burns is, in some ways, sadder than that of Cowper. He was a great poet, who left us a splendid legacy of poetic beauty, but he might have given us much more, had he not, largely through his own folly, died too soon, with many a gem of song unsung.

Burns was born at Alloway, near the town of Ayr, on January 25, 1759; and, being the son of an intelligent farmer, who justly valued education, he received a good and serviceable training as a boy. This should be remembered, for he is too often described as a "peasant poet," assuming him to have sprung from a race of farm laborers. Although, in his youth, he did engage in farm work, we must not confuse him and his people with the uneducated countrymen of his time. He had, indeed, the good fortune to have for his father a man who had a real love of literature, and so cultivated the taste in his pupil that, early in life, Robert began the study of literary form; by which we mean not merely the reading of poetry because it pleases us, but the examining of the very words and phrases, to discover how the poet builds up the beautiful word-pictures which engage and please our fancy.

#### WHEN ROBERT BURNS WROTE HIS GREATEST SONGS AND POEMS

While still employed with the work of his father's farm, much of Burns's time was spent in studying the poets, and particularly those who wrote in the dialect of his native land, such as Allan Ramsay and Robert Fergusson. When he was twenty-five years of age his father died, and the poet himself became farmer on his own account; but, being without money, he soon got into difficulties, and being a poet, instead of a man of business, he sought to free his mind of his troubles by forgetting about them while he wrote his poems. For all the world the results were glorious, and in one marvelous year he had written poems enough to make his name immortal. "The Cotter's Saturday Night," which is in *The Book of Poetry*, "The Jolly Beggars," and "The Address to a Mouse" were among them; but he had not improved his condition as a farmer. At the end of two years he was still in difficulties, but still pouring out his wondrous song, with a feeling, a grace, and a



John Dryden



Alexander Pope



William Cowper



Robert Burns



William Wordsworth



Samuel T. Coleridge

perfection of music which none before him surpassed, and scarcely any had ever equaled.

In the hope of raising sufficient money to leave his native land and try his fortune in the West Indies, the poet brought out the first collection of his writings in a volume published at Kilmarnock in 1786, a copy of which is now worth about \$3,500. Very soon these poems were being talked of everywhere, and, although only a few dollars had been earned by the book, the young poet saw that fame might be within his grasp; so, instead of carrying out his intention to emigrate, he decided to stay in his native land. Perhaps, for his later life, this was almost a misfortune, as he found himself, when he went to Edinburgh in the winter of that year, the lion of the hour, sought after by all the great people of the town. His book was reprinted the next year, and brought him some much-needed money, but the entire sum he made from it, over several years, was only \$2,500.

His great gift of song had now burst into full flower, and it is astonishing to discover how much he enriched the poetry of his native land in a short space of time, by writing numerous new songs to old tunes. In 1788 Burns moved to Ellisland Farm, near Dumfries, and married Jean Armour; but the next year he was appointed to a post in the excise service, which may be considered as one of his greatest misfortunes, for it led him into company, where his fondness for drinking alcohol had all too much encouragement. His farm, too, was a failure, and the remainder of his short life was neither happy nor creditable. Oliver Wendell Holmes has written these beautiful lines about him

"The lark of Scotia's morning sky!  
Whose voice may sing his praises?  
With Heaven's own sunlight in his eye,  
He walked among the daisies  
Till through the cloud of fortune's wrong  
He soared to fields of glory,  
But left his land her sweetest song,  
And earth her saddest story."

Robert Burns died, July 21, 1796, at Dumfries, where he was buried. It is not for us to condemn in him the follies for which he paid by his untimely death, but rather should we admire the great genius that gave to the world so precious a gift of immortal song, and honor those fine qualities of courage, independence, and manly energy which we find abundantly in the best expressions of his mind.

Another great poet, who was twenty-six years old at the time when Burns died, but who had not yet become famous, was William Wordsworth. He was born at Cockermouth, in Cumberland, on April 7, 1770, and the greater part of his long life was passed in the beautiful Lake Dis-



Lord Byron



Percy B. Shelley



John Keats



Lord Tennyson



Robert Browning



Elizabeth B. Browning

trict, not far from his place of birth. The life of Wordsworth was, happily, the very reverse in every respect from that of Robert Burns, and, as a consequence, although he lived to be eighty years, there is less to say about him. It often happens that the lives of men who have been foolish or unfortunate, and have died while still young, are more interesting to tell than those of men who have lived long and happily, and this is true in the case of Robert Burns and William Wordsworth.

#### THE YOUTHFUL DAYS OF WORDSWORTH, AND HIS FIRST BOOK

Wordsworth came of a good family. His parents died when he was young, but he was well looked after by his uncle, being sent to a private school, and later to Cambridge University.

As a young man, Wordsworth spent some time in Switzerland and in France during the distracted period of the French Revolution. When he was twenty-three, he published his first modest book of verse, in which he describes some of the sights he saw abroad. His book did not attract great attention. But here and there some persons of good taste—and particularly his younger brother-poet, Samuel Taylor Coleridge—read it, who realized that its writer had the gift of true poetry. Simplicity of words, combined with lofty thought, and the truthful picturing of natural scenes, were the ideals at which the young poet aimed, and these, throughout his long life, he always strove after—if not always successfully.

While his friends would have had him become a clergyman, he was more inclined to literary work, and as he came into a small legacy at the age of twenty-five, was, for a time at least, relieved of the need to earn his living. A few years later, the payment of a large sum of money, which the Earl of Lonsdale had owed Wordsworth's father, provided the poet with an income which was sufficient to make him free to give all his thoughts to his beloved art of poesy. He had settled with his sister Dorothy in a cottage at Grasmere, and their companionship was not disturbed by his marriage, in 1802, and is one of the pleasantest chapters in literary friendships. Wordsworth was, indeed, fortunate in many ways; he never knew the pinch of poverty, his friends were many and faithful, and his whole life was serene and happy,

flowing like a gentle stream through green pastures. He was honored and admired by the great men of his own day, and, on the death of his friend Southey, he was appointed Poet Laureate. He died on April 23, 1850, and was buried in the churchyard of Grasmere. Of all English poets, he was perhaps the most unequal, for, although he wrote much that was perfect, he wrote a great deal that was feeble and colorless; but as a writer of the short poems, called sonnets, no English poet except Shakespeare and Milton has ever excelled him.

#### SAMUEL COLERIDGE, THE POET WHO WROTE "THE ANCIENT MARINER"

Samuel Taylor Coleridge was two years younger than his friend Wordsworth, having been born in Devonshire, on October 21, 1772. He was the youngest child of a poor country vicar, and he received his education at the old Christ's Hospital in London, perhaps better known as "The Bluecoat School," because of the uniform worn by its scholars. He was a remarkably apt and brilliant scholar. In habits he seems to have been the dreamiest of boys, but his dreams were born of his deep and intelligent interest in the great works of literature. At Cambridge University he gave promise of his remarkable powers, but, falling into debt, he enlisted in the dragoons, for which service, of course, he was totally unfit. His captain released him after a few months, on discovering that his recruit was better fitted for the study than the barracks, and he returned to Cambridge for a time.

We next find him at Bristol, with his friend Robert Southey, dreaming bright dreams of a new and happier life across the Atlantic—dreams never to be realized. Still hard pressed for the means of life, he married and settled down for some three years in a Somerset cottage, writing in this period some of his finest poetry. "The Rime of the Ancient Mariner" and "Christabel" were two of his poems written here.

"The Ancient Mariner" is one of the most beautiful and perfect things in English literature. It describes, in the simple, unaffected style of the old ballads, the fateful voyage of a ship, whose disasters were supposed to have followed upon the shooting of an albatross, according to an ancient superstition of sailors. Although Coleridge had no personal experience of seafaring, all the men of letters who have

themselves lived a sailor's life are at one in considering "The Ancient Mariner" the finest of all the poems that have attempted to reproduce for us the mystery of the sea. This proves that the poet, by the exercise of imagination, can know, and make known to his fellow-men, the mysteries of Nature, without having gone through the actual experiences in his own person.

#### COLERIDGE'S LAST DAYS AND THE POETS HE INFLUENCED

It was largely due to the kindness of friends that the life of Coleridge was made possible. Left to himself, incapable of conducting his own affairs in an orderly way, thriftless and slothful, he would probably have sunk into abject poverty and died obscurely; but his friends, who admired his great genius, sheltered him, and cared for both him and his family. It was in the house of such a friend at Highgate, with whom he had lived for some nineteen years, that he died, on July 25, 1834.

Immensely admired by all the great men of his time, Coleridge had exerted a power over his fellow-poets even more remarkable than the volume and beauty of his own poetry. Among those who thus came under the spell of Coleridge were Byron, Shelley, and Keats, and, although they came a little later, we might say the same of Tennyson and Browning. Thus, all these great poets, who lived at the same time, were in some way his followers, and so we can measure his profound influence.

The story of Byron is almost as sad as that of Burns. He was born to unhappiness. His father, a dissipated officer of the Guards, was a nephew of the fifth Lord Byron, and his mother was a Scottish lady, who was singularly incapable of bringing up her child wisely, or making him a happy child. George Gordon Byron was born in London, on January 22, 1788, and was there left with his mother when his father went abroad, never to return. His mother took her little lame boy—for he had been deformed by infantile paralysis, it is believed—to Aberdeen, to be near her own friends, and there his early life was passed; but when, in 1798, his grand-uncle died, and he became Lord Byron, he returned with his mother to England, where his education was continued at Harrow and, later, at Cambridge University.

#### THE YOUTH OF THE UNHAPPY LAME BOY, THE FAMOUS LORD BYRON

He was a headstrong and passionate youth, and his behavior at college was marked by much foolishness; but the power of poetry was in him, although his first book, "Hours of Idleness," which was published during his college days, gives very little promise of the moving and glowing verse he was later to write. Visits to the ancient towns of the Continent, and particularly some travel among the historic scenes of Greece, shaped the young poet's mind to works of romantic beauty, and in 1812 the first half of "Childe Harold's Pilgrimage," his first great poem, and the finest of all his writings, brought him immediate fame.

Byron was now in London, as Burns before had been in Edinburgh, the lion of the day, admired and flattered by all sorts of people. He was not, however, happy in his marriage, and his conduct as a man was severely condemned. In the spring of 1816, when he was only in his twenty-eighth year, he left his native land for good, and became a wanderer on the Continent.

#### BYRON AS A SOLDIER OF GREECE, AND THE END OF HIS RESTLESS LIFE

During those years of changing residence, he wrote many fine poems, which brought him large sums of money; but his restless spirit knew little peace. The end of his short life became him better than much of his conduct after he left England. He joined the army of Greece as an officer in its war against its oppressor, the Turk, and if Byron was not fated to die fighting for the freedom of the storied land he loved, he was still in active service when fever overtook him, and caused his death on April 19, 1824.

The body of the poet was carried back to England, and conveyed by road to the burial-place of the Byrons at Hucknall Torkard, near their beautiful home of Newstead Abbey, which has long since passed into the hands of another family. So greatly had the romantic personality of the poet and the glamor of his poetry impressed themselves on his countrymen, that it is doubtful if the death of any other famous poet has ever occasioned so much emotion as that of Byron. Tennyson himself has told us that when he heard Lord Byron was dead he felt that nothing else mattered; and, certainly, when the poet breathed his last, at Misso-

longhi, one of the most powerful voices in English poetry was stilled.

**THE STORMY LIFE AND TRAGIC DEATH OF THE POET SHELLEY**

Another poet whose fate was also to become a wanderer abroad was Percy Bysshe Shelley, born on August 4, 1792, near Horsham, in Sussex. Shelley was a fair and beautiful youth, perhaps less manly in appearance than Byron, whose fine head and ardent eyes suggest at once a poet and a man of independent spirit. Shelley, like so many of the young men of his day, imbibed revolutionary ideas, as a result of the great revolution in France, and with these was united in him an unhappy revolt against the teaching of Christianity. The result was an ill-ordered and unrestful life, for, though his poetic genius greatly enriched English literature, with such fine works as "Prometheus Unbound," "Adonais," and the "Ode to the West Wind," we cannot help feeling that his life was unhappy and his end tragic. He was drowned off the coast of Italy, on July 8, 1822. His body was washed ashore near Viareggio, and it was cremated in the presence of some friends, one of whom was Lord Byron; his ashes were placed in a casket, and afterwards were buried in the Protestant cemetery at Rome.

**JOHN KEATS, ANOTHER GREAT POET WHOSE SUN WENT DOWN TOO SOON**

In that same burial-ground lie the remains of another great English poet, who was a friend of Shelley, and who had died in the year before the latter was drowned. This was John Keats, who was born in London, October 31, 1795. Though only the son of a livery-stable keeper, and doomed to die before he had reached the age of twenty-six, he had yet, in his short life, by the grace of genius, made his name immortal. His poetry has the curious quality of being at once classical and natural. That is to say, steeped in the knowledge of the ancient writers upon whom the great poets of the Elizabethan era had modeled their verse, Keats wrote with all the artificial beauty of the Greeks, while yet he contrived to convey a sense of the freshness and sweetness which comes only direct from the love of Nature, as we find it in Chaucer and in Burns. One of his finest poems, "To a Nightingale," is on page 2744. He died of tuberculosis while at Rome, on February 23, 1821.

Unlike the last three poets of whom we have been speaking, the next great writer who calls for our attention was to enjoy a long life of serene happiness. Alfred Tennyson, who was born at Somersby Rectory, in Lincolnshire, August 6, 1809, was the third of six sons. Although his name is pre-eminent among the poets of the nineteenth century, had he died at the age Keats was when he passed away, it is doubtful whether he would have been so well remembered to-day, for Keats at twenty-six had given us finer gems of poetry than Tennyson had produced at the same age. This will serve to show us how much the world lost by the untimely death of Keats.

**THE YOUTHFUL DAYS AND EARLY WRITINGS OF ALFRED TENNYSON**

Tennyson was brought up in a bookish atmosphere. His father, to whom his early education was due, was a man of literary taste; both his elder brothers were poets. At Cambridge he gained a medal for a poem, and in 1826, nearly two years before he went to the university, he had joined his brother Charles in publishing a volume entitled "Poems by Two Brothers," which has long been one of the treasures of book-hunters. He was thus a poet at sixteen, and a poet he was bound to continue, as poetry was the passion of his life. His first independent work, which was published in 1830, and a second series two years later, were received so coldly by the critics that nearly nine years elapsed before he ventured to publish another; yet in these books were such poems as "The Lady of Shalott," "The Lotus-Eaters," and "The Queen of the May," which have long been esteemed among the finest examples of his poetry.

Meanwhile he engaged himself on works which were destined to conquer not only the literary critics, but the whole reading public. When, in 1842, he published two volumes containing "Locksley Hall," "The Gardener's Daughter," "Lady Clara Vere de Vere," and many other poems of the rarest beauty, thrilling with a sweet new music, and mysterious with the glamor of old romance, he had quietly won the battle of fame, and was hailed on every hand as England's new king of poets. Wordsworth was then the commanding figure among the poets, but even he did homage to the genius of Tennyson.

## WHEN TENNYSON WAS A YOUNG MAN



The proper title of this charming, old-fashioned picture by Frank Stone is "The Duet," but it is particularly interesting for the portrait of Tennyson as a young man which it contains. The young poet is seen standing in a leaning position behind the settee, his thoughts apparently borne away on the wings of the melody.

His fame established, the remainder of Tennyson's long life was full of honor and of fine work. His was not a wild and wayward nature, so he was happily spared the disasters that have overtaken so many of the poets. Yet he did not escape the struggles that all who have not inherited riches have to face, for he was a man of forty before he felt he could afford to marry. He took this step in the same year that he was appointed Poet Laureate, in succession to Wordsworth, and the year was also notable, in his life, for the publication of one of his greatest works—"In Memoriam." On page 2191 we print some verses from this long and beautiful poem, in which Tennyson mourns the loss of a dear friend, Arthur Henry Hallam, the son of a great historian, who had been untimely cut off. The greatest achievement of his later life was the writing of the "Idylls of the King," in which the old legends of King Arthur are told again, and invested with a new beauty. He also wrote a number of plays, but, although many critics think

that much of his poetry is worthy to rank with the best of Shakespeare, he lacked the dramatic power in which the master poet was without a peer.

Tennyson, after his marriage, settled for a time at Twickenham, on the Thames, but in 1853 he went to live at Farringford, near Freshwater, in the Isle of Wight, where much of his life was passed, and in 1870 he became the owner of a very beautiful house, specially built for him at Aldworth, in Sussex, set on the edge of a woody hill, and looking clear across the rolling downs towards the south coast. Here, and at Farringford, he enjoyed many years of serene and happy life, the undisputed king of the literary world of his day. In 1884 his services to English literature were recognized by his elevation to the peerage as Baron Tennyson of Freshwater and Aldworth. On October 6, 1892, he died at Aldworth, and was buried in Westminster Abbey. His life has been written by his son, the present Lord Tennyson.

There was another great poet, very dif-



ferent from Tennyson in many ways, whose life ran its course with that of Tennyson. Robert Browning was born in London, May 7, 1812, so that he was but three years the junior of Tennyson, who also outlived him by three years, Browning dying on December 12, 1889.

#### A COMPARISON OF THE TWO GREAT POETS, BROWNING AND TENNYSON

Like Tennyson, Browning began to write poetry at a very early age, his first published work having been written when he was nineteen. His early education was chiefly derived from travel abroad, and Italy, as we have seen in the case of other poets, had much to do in influencing the poet's mind.

Like Tennyson, he sought to inspire his fellow-men with hope, but there is, perhaps, in his poetry a stronger feeling of courage than we find in Tennyson. His verses are rugged and unhewn, like the rocks on the seashore, while Tennyson's are polished and sweet with music, like a beautiful Italian garden with its fountains. He is not easy to understand at times, as he often tried to express more thought than his words could carry. In short, he is to be considered a greater thinker than a poet, although we have seen that in such pieces as "The Pied Piper of Hamelin," on page 370, and "How they Brought the Good News from Ghent to Aix," on page 2305, he could tell a moving story in clear and memorable words.

There were many contrasts in the characters of Tennyson and Browning. While the one loved to appear a poet in his person, as well as in his works, the other endeavored always to be regarded as an ordinary man of affairs. Tennyson was somewhat inclined to withdraw himself from his fellow-men; Browning thrust himself boldly into the everyday life of his time, although we cannot suppose that he had a lesser love of poetry than Tennyson had. But most people think that Tennyson was the greater poet of the two; and that his works will outlast those of Browning in the affections of most readers.

#### ELIZABETH BARRETT BROWNING, ENGLAND'S GREATEST WOMAN POET

Some people even consider, though not quite wisely, that Browning's wife, whose maiden name was Elizabeth Barrett, was a finer poet than her husband. It is true that, although Browning was thirty-four

when he married, and had written several notable works, his wife's fame was then greater than his own.

Mrs. Browning was indeed a remarkable woman. Born in Durham, March 6, 1806, the daughter of a wealthy landowner, she was so clever as a child that, when a girl of ten, she could read the poets of Greece in their native language, and at fourteen she had herself written a poem of some merit. An injury received when she was about eighteen made her an invalid for many years, during which poetry was the solace of her life. Her gentle nature, her warm love of the poor and oppressed, and her steadfast faith in the goodness of God, are all admirably expressed in her sweet and eloquent poetry, of which "Aurora Leigh," a work of considerable length, is perhaps the finest and purest flower.

#### THE LAST DAYS OF ROBERT BROWNING AT HIS PALACE IN VENICE

When the Brownings were married, in 1846, they left England, and took up their home in the lovely Italian town of Florence, about which we read on page 2787, and there, on June 30, 1861, Mrs. Browning died. Her husband survived her for many years, and towards the end of his life he removed to one of the fine old palaces that stand along the Grand Canal in Venice, as seen in the pictures on page 3077. There Robert Browning passed away, on the very day that his last book of poems, "Asolando; Fancies and Facts," was published; but his body was taken to England, and buried in Westminster Abbey on the very last day of 1889.

Edward Fitzgerald, who was born in the same year as Tennyson, is known for his wonderful translations of poetry from other languages into English. He is best remembered by his translation of a long poem called the "Rubáiyat of Omar Khayyám," a celebrated Persian poet, who lived centuries ago. Fitzgerald translated Omar's thoughts and clothed them in his own words, and the result is a beautiful and moving poem.

#### MATTHEW ARNOLD'S BUSY LIFE AND HIS WORK

Matthew Arnold, who wrote "The Forsaken Merman," on page 3401, was born in 1822 at Laleham, near the place where the battle of Hastings was fought. He was a son of Thomas Arnold, a very famous head master of Rugby, and with

the exception of one year at Winchester, all his schoolboy days were spent at the great school of which his father was the head. From Rugby he went to Balliol College in Oxford University, and graduated in 1844 at the age of twenty-two. He did not, like Tennyson, devote all his time to writing poetry. Rather, he made it the pastime of a very busy life, and, perhaps for this reason, most of his poems are short.

After his graduation he received a fellowship in the university, and later became private secretary to Lord Lansdowne, who was one of the most powerful statesmen of his time. Lord Lansdowne made him an inspector of the primary schools, and in this position he did much to raise the standard of education in England. In 1857 he was made professor of poetry at Oxford, and for ten years he filled this chair, in addition to fulfilling the duties of his inspectorship, a post which he held until two years before his death. Besides this he wrote books and reports on education, and critical essays.

Critics do not as a rule rank Matthew Arnold as high as Tennyson and Browning. Nevertheless his poetry is of a very high order, and many people think that "Thyrsis," an elegy written on the death of his friend, the poet Clough, is one of the finest elegies in the English language. "Thyrsis," "Sohrab and Rustum," "Balder Dead," "The Forsaken Mermaid" are favorites among his poems. He is even better known for his critical essays than for his poetry, and every high school student should study at least one of these essays, if only for the sake of studying his style.

#### DANTE GABRIEL ROSSETTI, THE PAINTER POET

Dante Gabriel Rossetti, who was six years younger than Matthew Arnold, was born in London. His father, who was an Italian, was professor of Italian at a London college. Young Dante Gabriel left school when he was about fifteen, to study painting, but in such a home as his, his education in languages and literature went on insensibly in fine conversation and daily reading. His father was a poet. His sister, Christine, whose beautiful poem "The Goblin Market" you will find on page 1867, became almost as famous as Dante Gabriel, and his other brother and sister are well known for their literary work.

As we have just said, Rossetti left school to study painting, and it was in this art that he first won his fame. He studied at a school called Cary's Art Academy, at the Royal Academy Antique School, and with the artist Ford Maddox Brown, and became a member of a famous band of painters called the Pre-Raphaelite Brothers, who sought to bring back to the art of modern painting the simplicity of the early masters. Rossetti was really the chief spirit in this movement, and had a great influence over the young artists of his day. He is classed with such painters as Holman Hunt, Millais, Sir Frederick Leighton, Burne-Jones and Alma Tadema. He had no less influence as a poet, and it is as a poet that we must think of him here.

He does not rank among the great poets, but his writing has wonderful beauty, and he had a remarkable power of writing so that his readers can see the same pictures that he saw. His famous poems are "The Blessed Damozel," a series of beautiful sonnets, which he wrote in memory of his wife, and a ballad "The King's Tragedy" in which he tells the story of Kate Barlass. He died in 1882 at the age of fifty-four.

#### WILLIAM MORRIS, A POET WHO MADE BEAUTIFUL THINGS

Like Rossetti, William Morris was a painter as well as a poet, and he was also a furniture maker. He was born in Essex, near London, in 1834. His childhood home was near Epping Forest, through which he roamed at will, and there he gained a love for nature, which he kept all through his life. It is said that he could recognize every wild bird of that forest on the wing. From a private school he went to Marlborough College and from there to Oxford. At first he intended to become a clergyman, but at Oxford he changed his mind, and determined to study architecture, and at the end of about a year his friend, Burne-Jones, persuaded him that his real genius lay in painting. Meantime he had begun to write, and in 1858 he published his first volume of poetry.

Although he studied both arts, he was destined to be neither an architect nor a painter. After his marriage in 1859, he decided to build a house, which should be, he told his friends, "a small palace of art," and this house was the beginning of the artistic movement of which you

may read in the "Makers of Beautiful Things." He had such difficulty in finding, for his house, furniture and fittings that were not heavy and ugly, that he had them made from his own designs. Furniture, wall-paper, hangings, stained glass, everything that was required for the house was made. From this it was an easy step to becoming a manufacturer, and with his friends, Burne-Jones, and Rossetti, and two others, he formed a partnership to manufacture wall-paper, tiles, tapestry and furniture.

Amid all this activity he found time to write tales and sketches, and the poems which place him high on the list of the minor English poets. Most of his poetry is story-telling in verse, in which he followed the model set by Chaucer. His busy life came to an end in the year 1896.

#### **A**LGERNON CHARLES SWINBURNE AND HIS MUSICAL VERSES

Algernon Charles Swinburne, who was a close friend of both Rossetti and Morris, was perhaps a greater poet than either, though not so fine a man, and he had not the ability that his friends had, of expressing himself in art as well as in words. He was born in London in the year 1837, but spent all his early years in the country. His grandfather had a home in the north of England; his father, who was an admiral in the British navy, bought a house on the Isle of Wight, and his family spent the warm summer months in the north, and the rest of the year in the south. The poet spent his schoolboy years at Eton, and from that school naturally went to Oxford, where he stayed three years, but left without graduating.

He must have been writing at Oxford, for the year that he left he published two dramas, "The Queen Mother" and "Rosamond." Five years later he published "Atalanta in Calydon" and other poems, which some one said introduced into the language "new astonishing melodies." From this time on he published many poems, and, while his work is not very well known by ordinary readers, it is generally conceded by students that he brought back to English poetry a rich flow of song that it seemed to have lost.

#### **P**OETS OF OUR OWN TIME, MOST OF WHOM ARE STILL ALIVE

Rudyard Kipling was born in 1865 in Bombay, where his father was curator of the museum. He was sent to England

to school, and after his return to India, at the age of seventeen, he became an assistant editor of a newspaper, and began to write the stories for which he is so well known. Many of his poems are very fine, especially those that are scattered through his volumes of short stories. He has published three volumes of poems, "Barrack Room Ballads," "The Seven Seas" and "The Five Nations."

William Butler Yeats, the best known of the Irish poets who have come to the front in what has been called "the renaissance of Irish poetry," was born in 1865 in Dublin. When he was a little boy, he went to school in London, where his parents lived for some years, but after a time they went back to Dublin, and he was sent to school there. At first he meant to be an artist, like his father, but his desire to write was too strong, and he began to send poems and articles to the Dublin periodicals. He has written much poetry, all of it dealing with Irish life, history and folk stories, and he has also written a number of plays.

Stephen Phillips, who lived from 1868 to 1915, attended Shakespeare's old school at Stratford-on-Avon for a time, and perhaps the association gave him the idea of becoming an actor at the end of his first year at Queen's College, Cambridge. Afterward he taught history to army students, but later on abandoned teaching to write plays and poems.

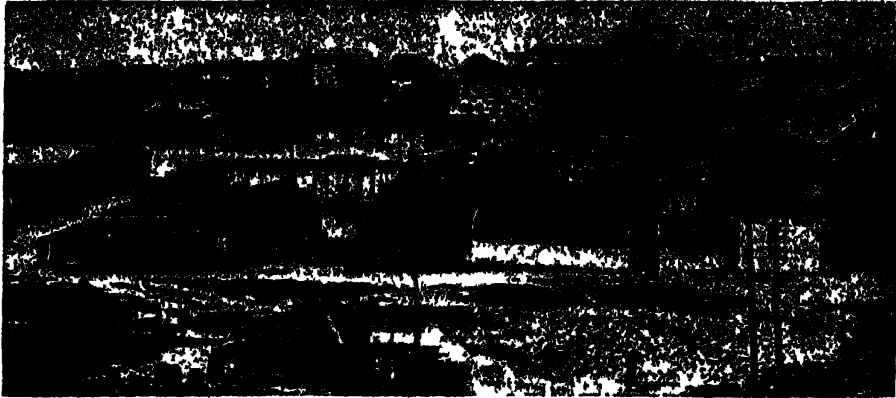
Two poets who are better known than Phillips in this country are John Masefield and Alfred Noyes. John Masefield, who was born in 1875, led a life of adventure in his youth. As a boy he became a sailor, and afterward spent some time in New York, where he was glad to work with his hands. Then he went home and began to write plays and poems and stories of the sea. His best poems are poems of the sea, because they are drawn from his own experience.

Alfred Noyes, who was born in 1880, received quite a different training, for he was educated at Oxford, and adopted literature as his profession in his college days. He has written fine poems, but it is too soon to say how many will live.

The same thing may be said of all these later men. No one can tell how many of the men, whom in our day we call great, will be able to stand against the verdict of generations that are to come.

THE NEXT STORY OF MEN AND WOMEN IS ON PAGE 6111

# The Book of ALL COUNTRIES



Santo Domingo, the Capital of the Dominican Republic

## THE ISLANDS OF THE WEST INDIES

THE history of the tropical islands of the West Indies is one long tale of stirring adventure—of Spanish treasure hunters, corsairs, buccaneers and bloody sea fights. Before the time of Columbus, there were legends of enchanted islands, far out in the Atlantic, that disappeared from view even as adventurous sailors were about to land upon their shores.

Look at the map of the United States and you will see four large islands stretching more than 1,300 miles eastward from the entrance to the Gulf of Mexico, and forming the northern shore of the Caribbean Sea. Cuba, Jamaica, Haiti and Porto Rico; these are the Greater Antilles. Curving outward and downward from Porto Rico until it almost touches the coast of South America is a chain of smaller islands which form the eastern end of the Caribbean, these are the Lesser Antilles. There is still a smaller chain of islands, the upper end of which almost touches Florida; these are the Bahamas, which are not a part of the Antilles at all. There are nearly 100,000 square miles of land in these islands, of which Cuba has almost one-half; Haiti, Jamaica and Porto Rico are next in size. Trinidad, another of the larger islands, lies away down at the lower end of the Lesser Antilles, so

CONTINUED FROM 5934

close to the South American coast that many always think of it as a part of that continent.

About the centre of the outer edge of the Bahamas is a tiny island of special interest, called Watling or San Salvador, because here it was long supposed that Columbus first trod on American soil, though some historians think that Cat Island, to the northwest, is the island which Columbus called San Salvador in the mistaken belief that he had reached India by a shorter route. The two original tribes of "Indians" whom Columbus and the first explorers found were called the Arawaks, and the Caribs. The first were a gentle race which were quickly exterminated by the Spaniards, but the Caribs fought for every inch of their land, and a few of them still survive.

### THE SPANISH GOLD SEEKERS EXPLORE THE ISLANDS

The first Spaniards, who accompanied Columbus on his later voyages, or went with the leaders who followed him, were fortune hunters. They did not want to till the soil; they did not even want to dig the gold which they hoped to bring back to Spain in such vast quantities. Work of any kind was unpleasant, and their purpose was to force the natives to dig gold for them. For this reason the first Span-

ish settlements were planted on the shores of Cuba, Haiti and Porto Rico, those big islands in whose mountains some gold was found. The low and sandy islands of the Bahamas, though first discovered, were neglected and left to other nations to settle or colonize. For the same reasons the Lesser Antilles were never settled by the Spaniards, though they claimed them as long as they possibly could.

The peaceful Arawaks, whom the Spaniards found living in the Bahamas and Greater Antilles, were not of the stock of which slaves are made. When they resisted the efforts of the Spaniards to force them to work in the mines, they

## NEGRO SLAVERY IS INTRODUCED ON THE PLANTATIONS

The Spaniards who remained behind gradually discovered that sugar, an expensive luxury in Spain, could be produced from the fertile soil of Cuba, Haiti and Porto Rico at a large profit. They had learned from the Arawaks how to plant and smoke tobacco, and a demand was also growing at home. Cotton brought better prices than wool. This was the beginning of the rich trade which sprang up between Spain and the West Indies, and the need of labor to work the large plantations brought with it a trade in negro slaves. Large numbers were imported every year from the west coast of



Kingston, the capital and chief port of Jamaica, is well located and has an excellent harbor. The town has many modern improvements, such as electric lights, street railways, and an abundant water supply. The suburbs are noted for their beauty, and the most attractive homes are outside the city. The town is kept clean and is healthful, which is rather unusual for a town in the West Indies.

were butchered. Those that were captured died soon after. In less than a hundred years after the first appearance of the Spaniards, there were only sixty families of natives in Cuba, and the neighboring islands had suffered in the same way. The Spaniards did not interfere with the Caribs, natives of the Lesser Antilles, a stronger and more warlike race.

As soon as the Spaniards found that gold was not so plentiful in the Antilles as they had hoped, the treasure hunters went further; Cortes to Mexico, to rob the Aztecs; others sailed to the Spanish Main, as the South American coast, from the mouth of the Orinoco to Darien, was called, in search of the fabled kingdom of gold, which they named "El Dorado."

Africa. If you were to make a trip to the West Indies to-day, you would see how many black people, and how few white people are living there now.

The ships of France, England and the Netherlands were at this time in search of new markets. They ventured to the Spanish islands, at first in the hope of picking up profits. When the Spaniards would not allow this, these vessels were used as slave ships. Then these merchant pirates began arming their ships and fell to plundering the settlements or to lying in wait for the treasure galleons of Spain and capturing them.

One of the most prominent of these sea rovers was Sir John Hawkins, who made three trips, between 1562 and 1567,

from the African coast, with slaves, to Hispaniola, as Haiti was called. On his third trip the Spaniards destroyed four of his five ships. At that time he had with him Francis Drake, then only a boy. Five years later Drake went forth in command of a venture of his own and raided the Spanish settlements on the Isthmus, though there was no war between England and Spain at the time. After the destruction of the Spanish Armada by the English, Spain began to grow weaker as a nation, and at the conclusion of peace with England, Spain was content to keep only the four islands which she was occupying, Cuba, Haiti, Porto Rico and Jamaica.

The first English settlement in these islands was made in 1624, by Sir Thomas Warner, at the head of a number of gentlemen adventurers. They first took possession of the island of St. Christopher, often known as St. Kitt's. The Caribs gave them a hard fight, and they had to call upon a French corsair, by the name of Esnambuc, for help. As a result, part of the island was given over to the French. In 1636 the Dutch made a settlement on St. Eustatius, and, in 1646, French colonists landed on St. Barthelemy.

The fierce Caribs, however, were by no means passive during these attempts to deprive them of their land. For many



The Bermuda Islands include 360 small islands but Bermuda proper is three times as large as all the others together. Hamilton a part of which is shown in the picture, is the largest town. The islands are of coral formation and are very beautiful. There are no streams, and people depend upon the rains for fresh water. Everywhere you will see that cisterns are provided for the storage of drinking water.

### OTHER NATIONS DEMAND A SHARE OF THE SPOILS

The English, the Dutch and the French began to occupy the smaller chain of islands, the Lesser Antilles, about this time. The Dutch West India Company was formed in 1621, the French in 1626, and the first English patents which led to plantations in this region fell between 1623 and 1627. Each one of the great European powers had a different reason for wanting to take possession of the islands. Spain wished for gold and mineral wealth, France desired trade and settlements, and the Dutch hoped to cripple their ancient enemy, Spain, by cutting off the sources of her wealth. The English intended to settle permanently.

years they fought the invaders of their islands, with more or less success. Finally, the few who remained, realizing that they must some day be overcome, made an agreement with the whites whereby the two islands of St. Vincent and Dominica were to be given up to them. Later many of them went to an island off the coast of Honduras. There, in Honduras and St. Vincent, the last of the fighting race of Caribs may be found to this day.

### THE ISLANDS PASS FROM HAND TO HAND

For nearly two hundred years after the first settlements of these islands, they frequently passed from hand to hand, for during this long period there was

hardly a year in which at least two of the great powers were not at war with each other. The most important of these changes, which was permanent, was the taking of Jamaica by an English fleet under Admiral Penn, the father of William Penn, in 1655.

Aside from the four nations of which we have spoken, a fifth element entered into the fighting. During all this time the Spanish settlements in Haiti had been in the eastern part of the island, around Santo Domingo, while the western part was left to the natives, who lived by hunting wild cattle and hogs. Here the roving traders and adventurers would put in for supplies of smoked meat. They were largely French and English, and were later joined by some French who had been driven away from the island of St. Christopher.

### THE RECKLESS BUCCANEERS RULE HAITI

This little colony of "boucaniers," or "meat driers," which is what the French word means, settled in the island called Tortuga, where they did a profitable business, and their little island became the centre of supply for the rovers and smugglers. These buccaneers, as the English called them, were raided by the Spanish in 1638. While away on a hunting trip their settlement was burned. In revenge they got together a fleet of vessels and made the robbing of the Spanish their chief business and pleasure. It was partly due to them that Spain lost one of her four big islands, Haiti.

Let us see how this came about. The "Brethren of the Coast," as they called themselves, went to the western end of Haiti. They were joined by other Frenchmen, who laid out plantations, brought slaves to work on the land, and prospered. Before the Spaniards were fully aware of the danger these men had built a fort at the head of the bay which sheltered them and called it Port-au-Prince. After a war between Spain and France, which ended in 1697, Spain gave up this end of the island to France.

### THE NEGRO REVOLT, AND THEIR LEADER, TOUSSAINT L'OUVERTURE

Ninety years later, on the eve of the French Revolution, this French colony had twice the population of the Spanish colony, and possessed more than twice its wealth and foreign trade. Then came the Great Revolution in the mother

country, declaring all men equal. The white planters accepted the new order, but they refused to apply its principle of equality to the black slaves. Even the free negroes were not allowed to become citizens. The result was an uprising of the negroes, led by a young mulatto who had been educated in Paris. This so alarmed the French government, especially as the English and Spanish forces were making a successful attack on the colony, that the negroes were declared free in 1793. This brought all the slaves over to the side of the French Republic.

At their head was now perhaps the most remarkable man the negro race has ever produced, Toussaint L'Ouverture. He was a full-blooded black, born a slave, but with a genius for commanding men. The French saw his great ability, and made him commander-in-chief of the native forces. He drove out the English and Spanish troops, and, in 1795, France and Spain made a treaty by which the Spanish colony on the eastern end of the island was ceded to the French. Toussaint L'Ouverture became governor-general and practically dictator. In 1801 he proclaimed the absolute independence of Haiti, with himself as supreme chief. Napoleon, who was then in power, sent out an army of 30,000 men, and a long war followed. Yellow fever came to the aid of the struggling blacks. The French general asked for a conference, which Toussaint L'Ouverture granted and attended in person. Here he was seized and carried over a prisoner to France, where he died in prison of starvation.

Meanwhile the blacks continued to fight. Finally the French forces were penned in and forced to surrender, and so France lost the greatest of her West Indian colonies. The Haitians declared their independence in 1804, and a negro, General Dessalines, was proclaimed president for life. Very soon he declared himself emperor, with the title of Jean Jacques I, but he proved to be such a brute that two years later his own soldiers waylaid and killed him. Until 1844, except for a little time when Spain regained her colony at Santo Domingo, the whole island continued under one government as the Republic of Haiti. Then there was a split, and the old Spanish colony became the Dominican Republic.

## THE DOMINICAN REPUBLIC

The Dominican Republic is nearly double the size of the Haitian Republic, but has only 700,000 people. Of these about one-tenth are Spanish, while the rest are principally colored people. The pure blacks are very few in number in Santo Domingo. There is a national congress of twelve senators and twenty-four deputies. Each senator represents a province, while the deputies are elected in proportion to population. American and English capital has been encouraged,

The population of Haiti is somewhere between 1,500,000 and 2,500,000, of which about ninety per cent is pure black. The remainder is colored, as those partly white are called. The few whites are mostly foreigners, as the French planters were expelled shortly after the declaration of independence. The exports are cotton, coffee, cacao, mahogany, tortoise-shell, zinc and copper, but the resources of the country are practically undeveloped. So strong is the prejudice against foreigners that they are not allowed to hold real property.



Nassau, situated on the island of New Providence, is the most important town in the Bahamas. These are the government buildings. The governor has authority over twenty inhabited and many uninhabited islands making up this group, but the total population is very small. The principal exports are sponges, hemp, lumber and pineapples. During the Civil War, Nassau was an important port for blockade-runners.

but there has been much disorder. There are a university, two colleges and many schools. The exports are chiefly sugar, coffee, cacao, mahogany, hides and honey, of which about half goes to the United States. In May, 1916, the United States landed troops to preserve order, and now controls the island.

## REVOLUTIONS IN HAITI, WHICH FORCED THE UNITED STATES TO ACT

The history of the Haitian Republic has been a very stormy one. Almost every ruler, whether emperor or president, has met a violent death. The uprisings have been so numerous that the United States government was compelled to send a military force to restore law and order, and it is still held there.

## SPAIN IN PORTO RICO, THE "RICH PORT"

After the capture of Jamaica by the English and the loss of their colony at Santo Domingo, the Spaniards kept only Porto Rico and Cuba. Like Jamaica, Porto Rico was much neglected; all through the seventeenth and far into the eighteenth century the beauty and riches of the island were overlooked. In 1700 there were only three villages on the island, and in 1765 there were only 45,000 inhabitants. At last Spain began to wake up to the value of this rich possession. Spanish peasants were sent out as real colonists and negro slaves were imported. In 1859 the Spanish Cortes, or legislature, granted a constitu-



tion to Porto Rico, which made it a province of Spain instead of a colony, and gave it representation in the Cortes. The way in which the United States gained possession of this island is told in another place.

The history of Cuba is by far the stormiest of all Spanish West Indian possessions. Until the latter part of the eighteenth century the colony did not grow much. A good many French immigrants came into Cuba after the revolution in Haiti. Wealthy planters from the South American colonies also came, and began to develop the land. The governor-general, however, was always a despot, with the power of a military commander in a besieged city. In 1879, after the first revolutionary movements had been initiated, the Cortes granted representation to Cuba, as it had done to Porto Rico, but the elections were so controlled that the deputies were nearly all natives of Spain, and not of Cuba.

The further history of Cuba under Spanish rule is that of a series of revolutions. Beginning with the organization of the Black Eagles in 1827, one uprising followed another until 1895, when the revolution was organized which terminated only with the active intervention of the United States, three years later, and the final loss of Cuba and Porto Rico to Spain.

The United States had declared that it would not keep Cuba, and held to the promise. When the Spanish troops left, the United States took control, but turned over the island to the Cubans in 1901. In 1906 a revolution broke out, and the United States again held control until 1909. Cuba is a republic, with a President, a Vice-President, a Senate and a House of Representatives. The population is about 2,500,000. Havana, with 350,000 inhabitants, is the largest city. The island has some important minerals, valuable forests and much fertile soil. It is one of the leading sugar-producing countries of the world.

#### **JAMAICA, THE CHIEF POSSESSION OF GREAT BRITAIN**

After the English occupation of Jamaica, Port Royal and Kingston, the chief ports, became the headquarters of the cruising buccaneers, rovers and slave traders. Jamaica was always the best customer for African slaves, which indicated the rapid growth of sugar plant-

ing. From this cause came the greatest disturbances in its history. Many of the blacks escaped to the mountains, where they lived in savage communities. These runaways, known as maroons, would descend from their strongholds and raid the settlements. An irregular warfare was carried on for many years. Finally peace was concluded by offering the maroons a reservation on which they would not be disturbed so long as they did not molest the whites. There were also violent uprisings of the slaves, even after they had been freed, in 1833. These were put down with a cruelty inspired by a fear of their vast majority in numbers.

#### **THE EXPORTS OF JAMAICA**

Throughout all the British West Indies the emancipation of the slaves caused heavy losses to the sugar planters. Together with this event came the discovery that sugar could be extracted from the beet as well as from cane; these two causes together seemed at one time to threaten the complete ruin of the West Indian planters. The sugar industry has never quite recovered. To-day bananas are Jamaica's chief export, followed by sugar, coffee and rum. Tobacco is of growing importance. As yet only a fourth of the island is under cultivation. Of the total population, numbering about 800,000, only 16,000 are white. There are about 20,000 Asiatic coolies, mostly Hindoos, in Jamaica, who have been imported as plantation laborers. Many smaller islands are attached to Jamaica, for governmental purpose. Kingston, the capital, is an attractive city.

#### **THE BAHAMAS DURING THE CIVIL WAR**

The Bahamas, neglected by the Spaniards and infested with buccaneers and pirates during the days of much fighting, became a Crown colony in 1787. The settlers were largely Loyalist colonists from the United States, who were expelled during and after the American Revolution. It was the contraband trade, brought by the Confederate blockade runners during our Civil War, that gave these little islands, and especially Nassau, their chief port, their first prosperity. Trade is still largely with the United States, consisting mostly of sponges, hemp, and pineapples.

In the Lesser Antilles, Great Britain possesses most of the islands. Of these

Barbados is the most important, though it is only twenty-one miles long and fourteen across. For its size it is one of the most thickly populated spots on the face of the earth. The inhabitants number 200,000, of which only one-tenth are whites.

#### THE LAKE OF ASPHALT

Trinidad is a large island, close up to the mainland of South America. At first it was thinly populated by the Spaniards, but after one of the several wars between them, Spain ceded it to England. The population is the same as that of Barbados, but hardly one-eighth of the land

El Dorado, the land of gold, which led so many Spanish grandees across the Western Ocean. The Dutch were the first to make permanent settlements here, but when Holland was dragged into French politics, in 1796, she lost to Great Britain the Cape of Good Hope, Ceylon and the Guiana settlements.

English settlers from Barbados attacked these Dutch settlements and took them with little difficulty. They were restored in 1802, but the next year Great Britain again took over what is now known as British Guiana. The colony is to-day of about the same area as Great Britain. Its government is still much



At first glance one could think that this street might be anywhere in North America, but it is really in Port of Spain, on the island of Trinidad. The city is one of the finest towns in the West Indies, and the scene shows a part of the European quarter. The building on the right of the picture is the English church.

is under cultivation. On the island is a great lake of asphalt, and this is one of the chief articles of export. Here, too, the sugar industry has been injured, but of late, cacao, coffee and tobacco have been exported at a growing rate.

#### MAINLAND POSSESSIONS OF GREAT BRITAIN

British Guiana and British Honduras, though mainland possessions, belong with the British West Indies. Both were brought under the Crown during the wars of the French Revolution. Guiana was the name given to a vast area east of the Orinoco River. Sir Walter Raleigh first penetrated these wilds in search of

the same as when held by the Dutch. Its staple crops are sugar and cotton, and the negro element is very large.

British Honduras arose out of settlements of wood-cutters, who migrated in the eighteenth century to the coast of Yucatan. They claimed to be independent of the rulers of Mexico. From about 1756, England began to extend her protection to these settlers about Belize Bay, though she did not dispute the rights of Spain. Belize was the port of shipment for the dye woods and other timber. There a form of local self-government grew up. In 1798, Spain attempted to expel these intruders, but the settlers,

aided by English sailors, repelled the assault and attained a sort of independence recognized by both powers. British Honduras is now a Crown colony of Great Britain, and prospers because of its wealth of mahogany.

#### THE GOVERNMENT OF THE ISLANDS OF THE WEST INDIES

The governments of the British West Indian colonies do not give much power to the people. The reason is simple. It is the great number of negroes, who do not know how to govern themselves. In the Bahamas, the negroes have little or no political power. The government of the colony is chiefly in the hands of a governor, an executive council and a legislative council appointed in England. There is a legislative assembly of twenty-nine members, elected by the people, but only those having property can vote. Few negroes vote and the electors are mainly merchants and property owners.

In Jamaica the negro outbreak of 1865 led the planters to desire the stronger government of a Crown colony. In 1884, a part of the legislative council was made elective. The Barbados House of Assembly is very old. Trinidad and Tobago, a small neighboring island, have a legislative council in common, nominated by the Crown; they have never had representative institutions.

#### FRENCH TERRITORY IN THE WEST INDIES

Though France can no longer be rated as a colonizing power in the West Indies, she still possesses two important islands in the Lesser Antilles, Martinique and Guadeloupe, besides French Guiana on the mainland. The first of these will be remembered because of the great eruption of Mt. Pelee. The island is about forty-five miles long and fifteen across, but extremely mountainous. Martinique, as the centre of French life and activity in the West Indies, was much disturbed by the French Revolution. A serious outbreak of the negroes occurred in 1831, but was suppressed. All free persons were given the political rights of French citizens, and in 1848 all the slaves were emancipated. The present population is estimated at 185,000, of which 10,000 are whites and the remainder colored. Like Guadeloupe, Martinique is a department of France, with one senator and two deputies to represent it. The governor

and the council are appointed by the home government. French Guiana has a population of about 50,000. The chief products are cocoa, sugar, ginger, coffee and fruits. It has valuable gold mines.

We remember Martinique chiefly because it was the birthplace of the unhappy Empress Josephine, and the ruins of the house are still to be seen. Off the coast of French Guiana is Devil's Island, where Captain Alfred Dreyfus was confined for four terrible years, from 1895 to 1899.

#### THE DUTCH WEST INDIES

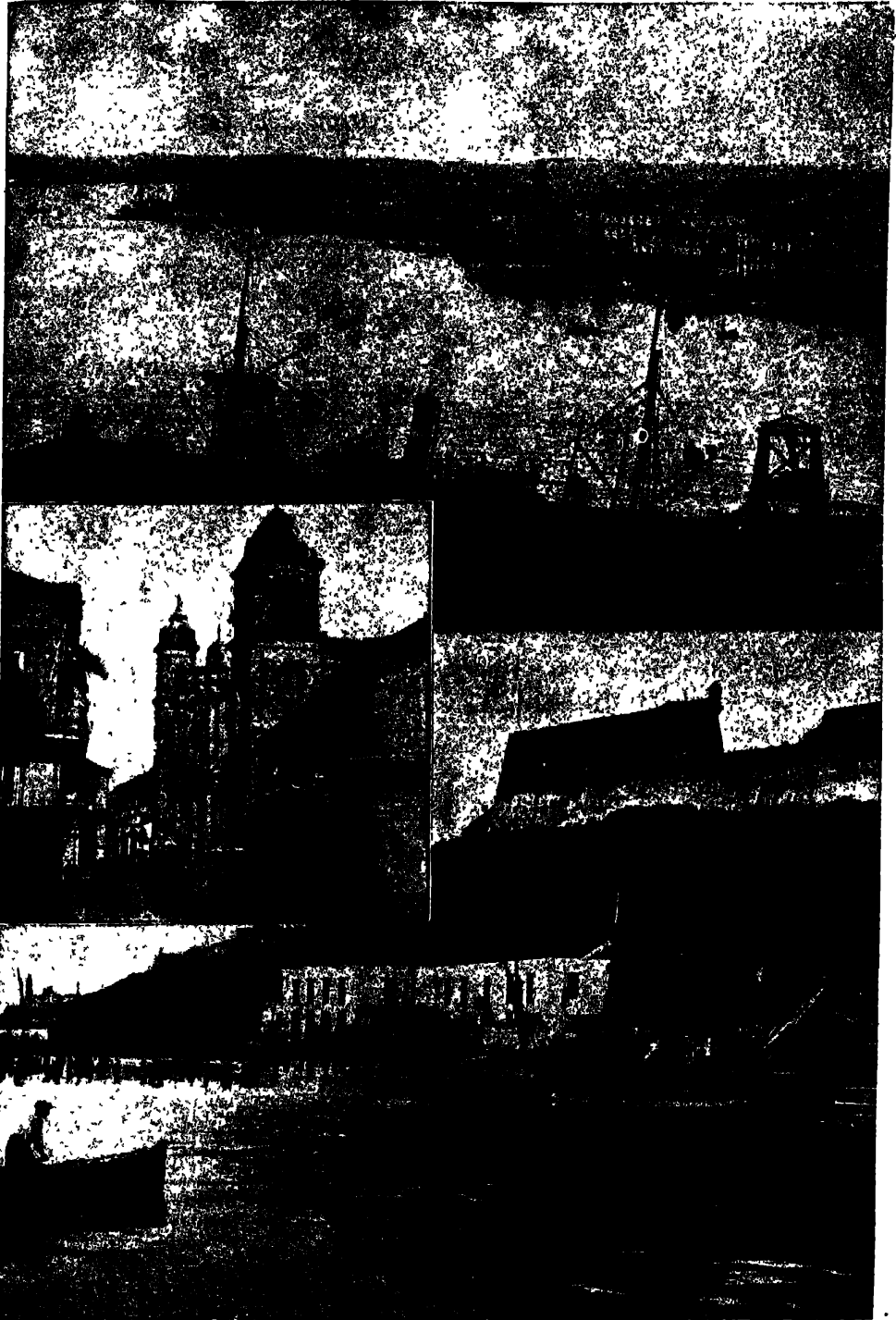
Curaçao, off the coast of Venezuela and west of Trinidad, is the headquarters of the Dutch colonies in the West Indies. Not only the neighboring islands of Buen Aire and Aruba, but Saba, St. Eustatius and part of St. Martin in the Northern Caribbees, are dependencies of Holland, administered by deputies of the governor of Curaçao. This island is about forty miles long, with a surface of arid plains. The inhabitants number about 30,000, of which about a third are negroes. There is a deficiency of water, and the people are compelled to store rain water. Corn, cotton, sugar, tobacco and fruits, phosphate of lime and the well-known liqueur, curaçao, made from oranges, are the chief exports.

#### NEW TERRITORY OF THE UNITED STATES IN THE WEST INDIES

Up in the northern part of the Lesser Antilles, close to Porto Rico, are three islands which are of special interest to Americans. They are St. Thomas, St. John and St. Croix. St. Thomas, the most important, is only thirteen miles long and three wide. It is still a centre of traffic, as it has been since the early days, and nearly all of its 15,000 people, of whom nine-tenths are black or colored, live in and about the seaport, Charlotte Amalie. The buccaneers and pirates were not slow in finding this sheltered bay and using it as a refuge. In 1671 the Danish West India Company took possession and established a trading station. St. John and St. Croix together have about as many people as St. Thomas, but their trade is small. The United States has desired these islands because of the need of a harbor for warships in the West Indies, and in 1916 purchased them for \$25,000,000. We tell more of them in another place.

THE NEXT STORY OF COUNTRIES IS ON PAGE 6097.

## SCENES IN HAVANA, THE CAPITAL OF CUBA



Havana harbor, seen in the first picture, is protected on the west by Punta Castle, and on the east by Moro Castle, and La Cabafia, which is shown at the bottom. The cathedral, built in 1764, where the bones of Columbus rested for many years before they were removed to Spain, is shown in the small picture.

## THE MOTOR-CAR THAT RAN LONG AGO

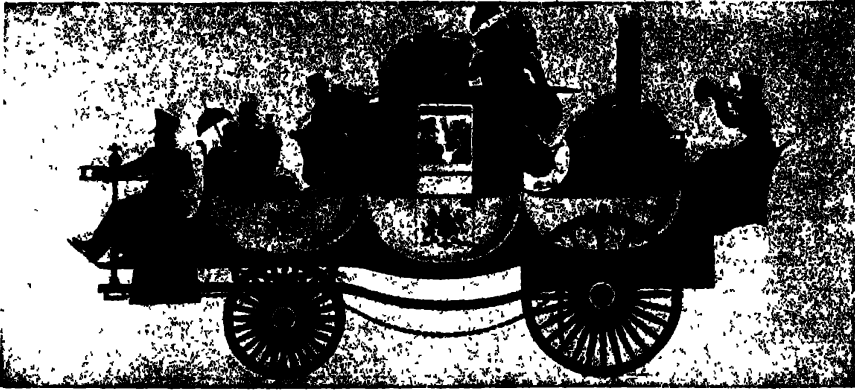


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### TRAVELING LONG AGO HOW OUR ANCESTORS TRAVELED

**M**OST of us have learned how railway traveling came into being, and we remember, therefore, the strange difficulties our ancestors had in getting about the country in the days before the iron horse.

But many of us have not thought, perhaps, of the troubles which lay in the way of getting from city to city, or about the cities themselves, in the olden days such as those in which Shakespeare lived. A man who was setting out on a journey of a hundred miles by road thought it so perilous an adventure that before starting he would sometimes sit sadly down and make his will, and bid farewell to all his friends, in the belief that there was every chance of his never seeing them again. And the dangers of town travel were quite as real and alarming as those which were supposed to await the daring man who traveled from London to York by the stage-coach.

The streets were not lighted, and after dark the smaller thoroughfares teemed with robbers, who killed or robbed as a means of livelihood. Highwaymen, mounted on swift horses,

CONTINUED FROM 5980

prowled about the outskirts of London, and footpads infested the streets of the city itself. Therefore, except for those who were rich enough to keep a coach, to venture into the streets at night was a serious undertaking not to be dreamed of unless link-boys, carrying flaring torches, walked before the party to light up the way. Iron link-stands supporting a ring, in which the link or torch might be placed, may still be seen at the doorways of old London houses.

Except on horseback or by coach, there was no way of getting about London by day save by walking or taking a boat on the Thames. It was not until the year 1605 that the first cab ever seen in England appeared on the streets of London. A few old coaches which had been sold by private owners were bought, and sent forth for public hire. They were called hackney coaches. There is some doubt as to the meaning of the name, but the belief is that they were so called because the first cabs started from Hackney. The new idea became very popular. It was a great thing for Londoners of that age to be able to go

into the streets, call a cab, and ride to the place to which they desired to go.

To those who could afford to pay the fare, it was as if the magic carpet had suddenly been placed at their disposal. Ladies could go out in pretty dresses and shoes, saved at least from the horrible condition of the streets and roads, which at that time were a disgrace. The London highways were then full of pits and holes, in which collected mud and filthy water and garbage thrown from shops and houses. The new carriage might bump and jostle as it crashed over these uneven ways, but, at any rate, the rider would arrive dry-shod and with costume unspoiled.

But the public never gained an advantage of this sort without a great outcry from somebody or other. The Thames boatmen were furious at the success of the cabs, and one of their number, John Taylor, called "the water poet," wrote an angry pamphlet against the cabs and the people who used them.

Soon the success of the coaches induced an old retired sea captain, named Baily, to set up coaches specially built for the purpose. He did not buy the old, worn-out family coaches, but built smaller and lighter vehicles, which were a great improvement. Owing to the badness of the roads, these required two horses to pull them; but it was a great thing to get them at all, for here was a new idea—carriages made specially for the convenience and comfort of people who could not afford to have their own.

The new cabs took up their position where St. Mary's Church now stands in the Strand, which therefore became the first public cab-stand in Great Britain. The new vehicles were a great success, and they were speedily copied by other men.

#### THE KING WHO TRIED TO STOP THE CABS

All sorts of objections were raised against them. People at that time could not understand that the right to ride should be enjoyed by any but the rich. People complained that the cabs wore out the roads—these wonderful roads which were already full of chasms and pitfalls. They did not see that they must build better roads; they simply cried out that the cabs must be prevented from running. Charles I. took sides with the enemies of the cab, and

issued an order declaring that the cabs were unnecessary and dangerous, and that their numbers must be limited.

#### WHEN PEOPLE WERE CARRIED ABOUT IN SEDAN CHAIRS

But even King Charles could not sweep away so desirable an aid to travel as the cab without offering something in exchange, and the substitute that he offered was the sedan chair. This had just been introduced into England from Europe, and took its name from the town of Sedan, in France, where it was first used. It was a vehicle like a small cab, with side windows and entrance through a linged doorway at the front, but it had no wheels, and men were to carry it on two stout poles. The occupant could raise the roof if he wanted to stand. A Court favorite was to have the sole right of providing these chairs and of drawing the money which they earned.

People cried out against the new invention. They hated the thought of men being employed as beasts of burden. But the idea soon became popular, and people had sedan chairs built for private use all over the country. Alike in Paris and London the sedan-chair man soon became an institution. The vehicles themselves were often beautifully painted, and they continued in use up to a century or so ago. At Peterborough they were used until 1860; Exeter had one until 1879; Newcastle until 1885; and Bury St. Edmunds until 1890. They are still in use in the public baths at Ischl in Austria, and in the city of Bath, England, as a mode of transit to the medical baths. The chair can be taken into the bedroom and the invalid carried to the baths without exposure to the outer air. The poles are so arranged that the chair may be carried up and down stairs.

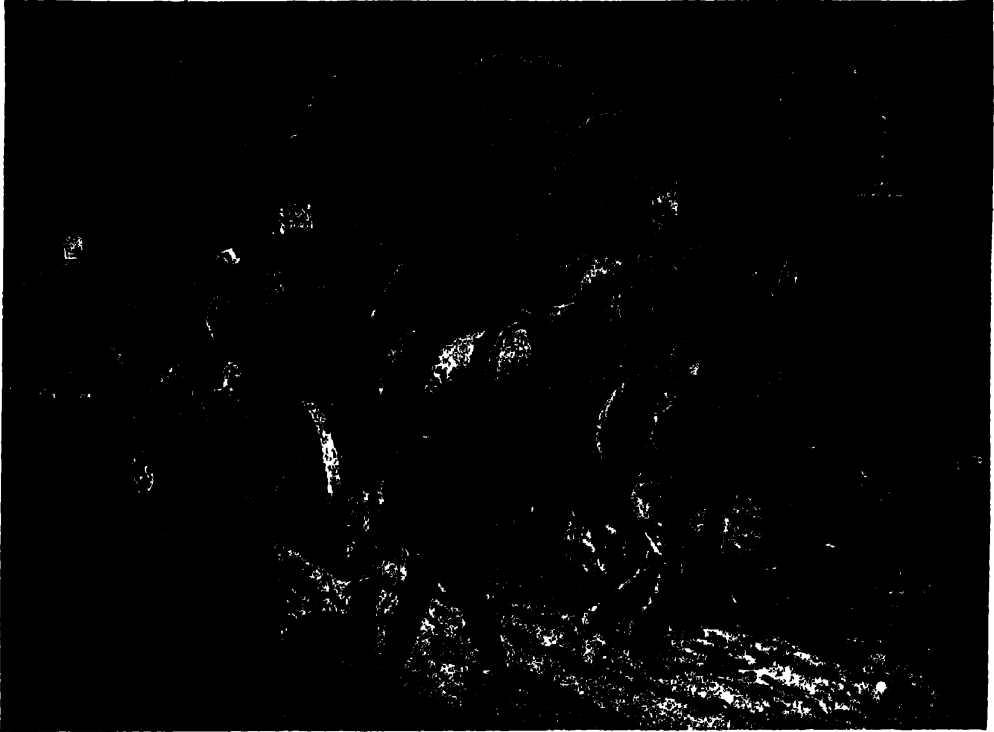
If we live near New York, or go for a visit to that wonderful city, we can see two sedan chairs in the Metropolitan Museum. Both of them were made and used in Europe in the eighteenth century.

Happily, the sedan chairs did not kill the cabs. Heavy taxes were put on these vehicles, which were so much disliked by Charles II. that he issued a proclamation forbidding them to be used at all. No notice was taken of this proclamation, and, after the Great Fire had led to the making of wider streets, the number of cabs increased very rapidly.

## THE COMING OF THE HANSOM CAB

The great change came with the appearance of the hansom cab. Many different types were tried. Some opened at the back, with the driver sitting perched high up above the door; others had the driver's seat at the side, and in all sorts of queer positions. It was Joseph Aloysius Hansom, an architect, who designed the cab which bears his name. The hansom was patented in 1834, but was afterward greatly improved. It was the favorite vehicle for traveling about

been hung by long straps from the four corners to pillars erected upon the under carriage. After the first few months the omnibus did not pay, and Paris saw no more omnibuses for another 150 years. Soon after their revival in Paris, a Frenchman named George Shillibeer gave London its first buses. They ran from Paddington to the Bank of England, at a fare of one shilling for the whole journey, and sixpence for the half journey. The service started on July 4, 1829, and the vehicles, first called omnibuses, came to be known as "shillibeers," after their



HOW VISITORS FROM THE COUNTRY ARRIVED IN LONDON A HUNDRED YEARS AGO

London until the motor-cab appeared, and was also much used in the United States.

But cabs are for the few, and the hansom brought no advantage for the masses of the people, who could not afford to take a cab. For these came the omnibus, first seen in London in 1829. It was not an English invention. The first bus appeared in Paris in 1662. The idea originated with Blaise Pascal, the great writer, and was carried out under favor of Louis XIV., the "Grand Monarch." It was in his reign that steel springs were first applied to wheel carriages. Before this the coach had

inventor. Shillibeer provided papers for his customers to read in the bus, but a rival owner did still better by fitting up bookshelves in his buses containing the newest books of the day. As dishonest people stole so many books, however, the library had to be stopped. Poor Shillibeer was ruined as a bus-owner, partly through rivalry with the railways, and partly through unfair treatment by the Government, which taxed him without mercy. He afterwards started a business in funeral coaches, and so "shillibeer" became the name of the hearse. But for that, buses would probably have been called shillibeers to this day. Many



## HOW OUR ANCESTORS WENT BY TRAIN



First-class passengers in one of the old-time railway trains in England.



Second-class passengers entering their carriage in the old days



Third class passengers traveling in open trucks in the first days of railway trains.

## THE FIRST BUS, FIRST CYCLE, & FIRST TRAIN



The first omnibus in London, built and run by Shillibeer, a famous coachbuilder, in 1829.



The earliest kind of bicycle, in which the rider ran along the ground as he sat astride.



The first train in England, with a man riding in front carrying a danger flag.

people remember the time when buses drawn by horses were the chief public vehicles in New York.

With many improvements, buses drawn by horses flourished until motor-buses were introduced. There were then nearly 4000 horse buses in London, and to run these some 40,000 horses were kept.

London was very slow in adopting the idea of running public vehicles on rails laid on the street. Though such cars drawn by horses had been started in New York in 1832, it was not until nearly thirty years later that an American, George Francis Train, introduced the plan into England. It met with so much opposition on the part of horse owners that it failed. A little later horse cars were again introduced. Then came cars drawn by steam engines, until finally electric cars have become common.

#### TRAVELING IN AMERICA MANY YEARS AGO

In the early days before the Revolution the people in this country traveled chiefly in their own carriages, or on horseback, as the roads were so bad in many places that no wheeled vehicle could be drawn over them. Often the woman, going to town, to church, or to visit a neighbor, rode on a horse behind her husband or her father.

Two-wheeled vehicles called gigs or chaises were common years ago. You may read about the "Wonderful One-Hoss Shay" in another volume. Generally in the old days people rode in farm wagons without springs. Thousands who went to settle the great West loaded their household goods into wagons which came to be known as "prairie schooners." The women and the youngest children rode while the men and older children walked. At night camp was made on the prairie. When several families were moving together the wagons were arranged in a circle at night, for protection against the Indians.

A few coaches ran between the principal towns, which, we must remember, were little more than villages. Most of them were dirty and uncomfortable as well as very slow. The trip which we now easily make in an hour was then a day's journey, and sometimes required a part of the night as well. Very often the passengers had to get out to lighten the load when going up hill, and even

had to push or tug at the wheels when the coach stuck in the mud.

Some of the best coaches, however, made excellent progress where the roads were good, and could be depended upon to arrive on the minute. Horses were frequently changed. When the coach drove up, fresh horses were waiting, the tired team was quickly unhitched, the fresh one was put in, and the passengers were again on their way in less time than is now required to change engines on a fast train. Nearly all of these stage lines, however, went out of business with the coming of the railroad, though in some parts of our country, not yet reached by the railroad, a few old-fashioned stage lines still continue in operation.

Some of them have been changed to automobile lines. Indeed the motor car has opened up some country in the West not yet touched by railroads, and into which horses could not be taken very well on account of scarcity of food for them. This is the so-called "arid region," where very little rain falls. In much of this region, however, the soil itself is excellent and needs only water to produce large crops. In some places great dams have been constructed across rivers flowing from mountains near by, and the water is conducted to the dry region. Other streams will in the future be turned into the region, and the area of the desert will grow smaller.

In the cities of the United States buses were common in the early days, and still run in a few towns where there is not enough business to pay for putting down rails. But this country has been ahead of any other in furnishing cheap methods of getting about. After the horse cars were introduced, the cable cars followed. These cars were drawn by a moving cable running underground between the tracks. A "grip" attached to the car would seize the cable when the gripman on the car moved a lever and the car would be drawn along. When the lever was moved another way, the grip let the cable loose and the car stopped.

The electric car, which was first successful in Richmond, Virginia, in 1888, has, however, succeeded all other means of cheap transportation. Electric cars run on the streets of every city in the United States and Canada. Many towns are joined by these electric

## TRAVEL IN THE COUNTRY AND IN THE CITY



In such wagons as these the journey across the plains toward the West was made before the days of railroads. These wagons, with their cloth top supported by wooden bows, were often called "prairie schooners." In them were packed the household goods, and the mother and smaller children, while the father and older children walked. Usually several traveled together for defence against the Indians.



Before the days of electric cars, one of the chief modes of travel in American cities was the stage, drawn by two or three horses. In the old days they were sometimes placed on runners in winter. This stage, which has been preserved, once ran on the streets of New York and was one of the favorite methods of reaching Central Park.

Pictures by Brown Bros



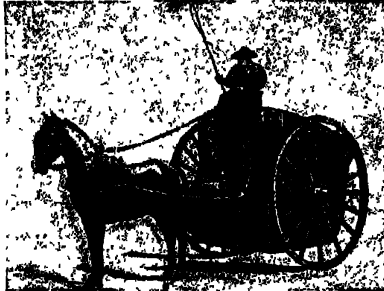
THE FINE COACHES IN WHICH THE RICH TRAVELED LONG AGO

railways and thus farmers can go to town whenever they wish.

Think what these changes have meant to city and country alike. They enable men to live at greater distance from their work, often in more healthful places. Without them our cities would be more crowded, and intercourse with our friends more difficult.

One reason why so many boys have left the farm has been the loneliness. The country car line and the telephone have done much to remove the disadvantages of country life. When one can reach the neighboring town in a few minutes, the members of the farmer's family can feel themselves to be a part

of the great world. Every year many miles of rural trolley lines are built, and the mileage will continue to increase.



THE FIRST HANSON CAB

What the future will reveal as to methods of transportation one can only guess. Perhaps the gyroscope car which runs on one rail, and about which we can read elsewhere in this book, will become quite a common sight. Perhaps trolley wires will be strung above the main roads, and vehicles

fitted with motors may run along the road though no rails are laid. It is quite possible that we shall all use flying machines. Who knows?

\* THE NEXT SECTION IS ON PAGE 5145.



THE SLOW WAGONS IN WHICH THE POOR TRAVELED LONG AGO

## A RAILWAY STATION IN OLDEN TIMES



The railway station at Liverpool in the early days of trains.



King Louis Philippe of France entering a train at New Cross Station, London, in 1844.



The opening of the Glasgow and Garnkirk Railway in 1831.

RIDING HORSES IN THE WILD SEA WAVES—A SEASIDE SCENE 2,000 YEARS AGO



Greek warriors riding their war-horses through the surf—"on the sea-beat coast, where hardy Thracians tame the savage horse."

This splendid picture suggestive of the magnificent friezes of ancient Greece, is by Mr. W. Frank Calderon, owner of the copyright.

# The Book of NATURE



A striking picture of horses hard at work.—“The Forest Team,” from painting by N. H. J. Baird.

## THE STORY OF THE HORSE

**EVERY** one loves a horse, and admires him in action. Whether he is an Arab, or thoroughbred, eager for the race; a great Percheron or Clydesdale, throwing his weight against the collar, as he hauls a heavy load or draws a plough through the fresh earth, or a child's pony, as proud of his pretty trappings as his little rider, every line of a horse's body shows that he is built for strength and power.

Next to the dog, the horse is the most faithful and intelligent four-footed friend we have, and we have none that has given us truer service, or can show greater devotion to his owner. Even among the nations that despise the dog as unclean, the horse is loved for his faithfulness and intelligence, and a tired and hungry rider will always see that his patient horse is cared for before he attends to his own wants.

Scholars have taken special pains to trace back the history of the horse. Their search has carried them far back, beyond even the picture records of the cave men, among the fossils of animals that had died out even before the cave men lived, and they are able to tell us more about the horse than about any other animal in the world. It is a very interesting story that they have to tell, and it is all the more

(CONTINUED FROM 6002)



interesting to us because it is believed that the early development of the horse began on our own continent. Fossil skeletons have been found, in Wyoming and New Mexico, which tell his life story from very early times.

### HOW THE HORSE IS DISTINGUISHED FROM OTHER ANIMALS

Before we go any further, we must remember that all the members of the horse family are distinguished from other animals by their teeth and their feet.

The teeth of the horse and other members of his family are made of three substances, dentine, such as all teeth are made of, cement and a very hard kind of enamel. As you know, the horse lives chiefly on grass and grain; but his teeth are so made that he can grind this hard food into very small fragments. With constant grinding the teeth wear down, but they do not become blunt, for the cement and dentine wear away more quickly than the hard enamel, which projects just a little above the rest of the tooth and is always sharp enough to grind. The teeth are formed a very long way within the bones of the jaws. As they wear away they push upward and downward, and the bone of the jaw grows inward to fill the hollow spaces



left behind. By this wise provision of nature, the horse is able constantly to renew its teeth until it has reached the age of thirty or thirty-five years. The teeth have a peculiar form, and from this we are able to say that the elephant, the rhinoceros and the little hyrax, about which you may read on page 1011, are very distant relatives of the horse family.

Now we come to the peculiarity in the feet, which is a distinguishing mark of the horse family. You know that most of the animals walk on their toes, and the peculiar thing about the horse family is that its members have only one toe left to walk on. They have lost all the others.

#### THE HORSE'S ANCESTRY IS TRACED BY HIS TOES

The early ancestors of the horse must have had five toes, like all other animals, but from the beginning the horse had to save his life from his enemies by speed. Like all fast runners, he ran on the tips of his toes, which became very strong. Gradually, however, he threw all his weight on the centre toe. With each succeeding generation it became stronger and longer, the other toes were used less and less, and became weaker, and in time they ceased to grow at all. Now if you will look at the picture of the horse on page 6068, you will notice joints which are marked "knee," "hock" and "fetlock." They look as if they were in the legs, but really they are part of the feet. The "knee" and the "hock" are what correspond to our wrist and ankle bones, the "fetlock" is what was originally the upper joint of the toe. The nail has grown out into a thick hoof to protect the toe, and underneath it is provided with a soft cushion called the "frog," so that the heavy animal will not feel a jarring through his body when his weight is thrown on his toes as he gallops over the hard ground. All this is true also of the donkeys and zebras, the other members of the horse family, which all have teeth and feet of the same kind. These distinctions have made it possible to trace the history of the horse back with scarcely a break to his earliest ancestors. We can even say that the second and fourth toes were the last to be lost, and under the skin of the foot there are still to be found two small bones called splints, which are the last remnants of these toes. The pictures on page 3669 will help you to understand this.

#### EARLY ANCESTORS OF THE HORSE LIVED IN WYOMING

The earliest direct ancestor of the horse of which we really know anything, lived possibly three million years ago in the forests of a plain which is now part of Wyoming. It was a slender little beast, only sixteen inches high, and had four toes on its front feet, but only three on its hind feet. This little horse has been given the pretty name of the *eohippus* or "dawn horse." It was descended, students are certain, from an animal with five toes on each foot, which was the ancestor also of the rhinoceros, the tapir, and perhaps the rodent families, but no fossils of these earlier five-toed ancestors have yet been found.

The world in those days was a very different place from what it is now. The climate everywhere was much warmer, and moister; there were no dry plains, but there were many swamps; there were seas where now there is dry land, and land where now there are seas. North America was probably joined to Asia, in the region of Bering Strait, and there was no sea between Arabia and Africa. It is important to remember this, or we shall wonder how horses found their way to the Old World, part of which is really younger than the New World in which we live.

Even before the time that the *eohippus* lived, some of its ancestors had wandered across Asia into Europe. Part of the skeleton of a near relative of the *eohippus* has been found in Great Britain, but all the members of this part of the family died out, or perhaps were killed by beasts of prey. Later on Great Britain became an island, and no horses reached it until they were brought by man.

The little *eohippus*, too, had many enemies,—strange, fearsome, dragon-like beasts still lurked in the forests, and there were fierce, four-footed animals for which it made a sweet morsel. Only the strongest, most intelligent and swiftest of the little horses could escape from their foes.

Hundreds of thousands of years passed. The old enemies of the horse died out, and new ones appeared. Still it steadily grew larger and stronger, and more like the horses we know. First it lost the fourth toe on the front foot, and we speak of it as the three-toed horse. Next the centre toe became so long that the other toes hung helpless on each side, and at

last these helpless toes disappeared. Different names have been given to it by scholars in the different stages of its life, but we shall not ask you to remember any more.

Meantime the world had been changing. Mountains like the Alps and Pyrenees grew up; the swamps dried; and there was a great deal of high, dry ground, where before there were only low forest-covered plains. The horse found that by keeping to the high, dry ground he could escape his enemies of the swamps. He learned to feed on the coarse grass that began to cover the plains. His teeth changed so that he could grind it up, and as they grew longer, his head became larger and stronger so that it could hold these enormous teeth. His feet and legs lengthened to give him speed, his neck grew longer so that he could reach down to crop the grass, and by degrees he became very much like the wild horses that have been brought from Asia to our zoos.

#### WHEN ALL THE HORSES IN AMERICA DIED OUT

By this time horses had spread, probably from America, over the high plains of Asia, Europe, and the north of Africa. In America there were troops of horses of many kinds. Their fossils have been found everywhere from Alaska down as far as Florida. There were large horses and small ones, heavy horses and light ones. But, before the beginning of the Ice Age, something happened, no one knows what, and every horse on the continent of North America disappeared. The sea had destroyed the bridge of land that once stretched across the Bering Sea to Asia, so that none could cross, and there were never again any horses on this continent until the white men came. It was even thought that no horses had been native to the country, but recently their fossil remains have been found where they died, and from these their history has been told. Not long ago there were many wild horses in Australia, but these were descended from animals that escaped from the settlers. None of the early horses ever reached Australia.

As time went on horses became very numerous in the Old World, and the different branches of the family grew to be very unlike each other. Some of them were heavily built, with coarse necks, heavy heads, and the stiff upstanding

manes that we call hog manes. Most of these coarse, ugly horses lived in central Asia, and on the plains of Europe. Drovers of these horses still exist on the central plains of Asia, and some of them were found in Russia at the beginning of the last century. In the forests of Europe, some small neat horses lived, and the descendants of these horses are found, it is said, among the ponies of Norway and Ireland and the western Hebrides. A third kind of horse had long, fine legs, a long, neat, well arched neck, large brain, large eyes, broad forehead and a long, neat, pointed head. It is believed by men who have made a study of the subject that this horse developed in the north of Africa, and from it the famous Arab horses and the Barbary steeds are descended.

In later times, through the agency of man, all these families of horses became mixed. With careful breeding, many different families have evolved; but they are all descended from the three families of which we speak. Our large, heavy cart horses are most like the coarse, heavy-headed, heavy-limbed horses of Asia, but the lovely Arabian horses, with their long, sweeping tail and silky mane, and our beautiful, intelligent, fiery thoroughbreds are descended chiefly from the slender-limbed, neat-headed African horse.

#### THE HORSE BECAME THE FRIEND AND SERVANT OF MAN

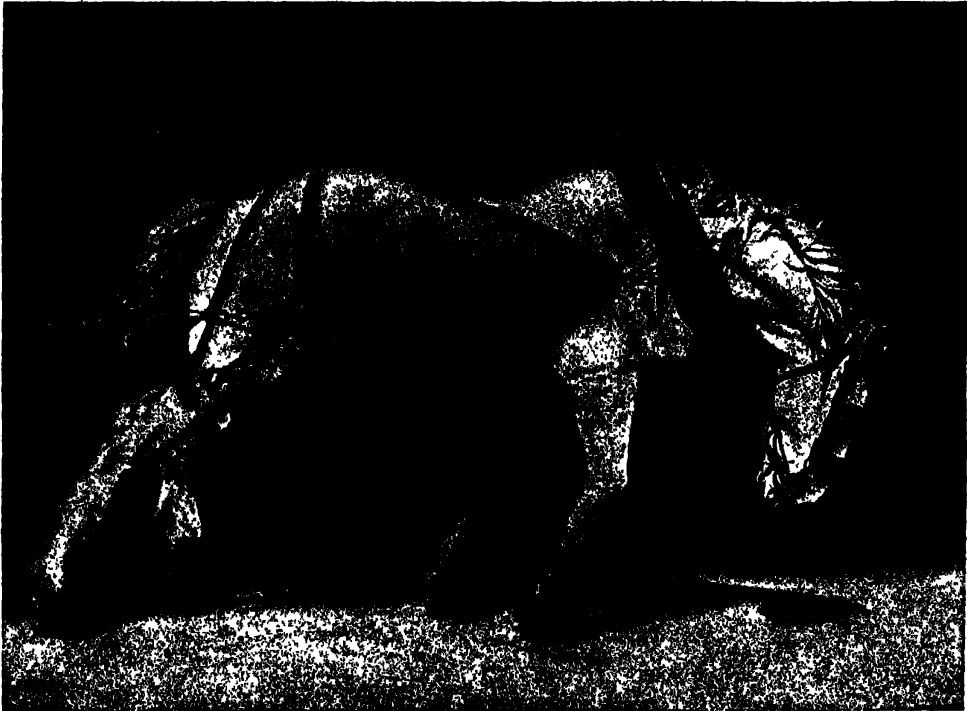
When man came into being, the horse gained a new enemy, and one who could fashion weapons with which to slay him, and make traps to ensnare him. In one place in Europe, which was the haunt of early man, the bones of thousands of horses have been found, where they were made into a shelter. We know, therefore, that our early ancestors found in the horse one of their chief sources of food, and from hunting him for food, it was an easy step to tame a friendly animal like a horse.

We cannot tell who first used the horse as a beast of burden, or who, long after he was tamed, first learned to yoke him to a chariot. It is natural for man to love animals, and there were times perhaps when ancient men trapped a foal with its mother, and saved it for a pet and plaything for his children. Such a pet, except in time of famine, would be spared, and so in time perhaps a race

## THE TOWN HORSE AND THE COUNTRY HORSE



**"THE JOY OF LIFE"—A PICTURE OF COUNTRY HORSES, BY LUCY KEMP-WELCH**



**"HARD LABOR"—A WONDERFUL PHOTOGRAPH OF A TOWN HORSE**

This photograph of a horse in a city street is taken from "The Amateur Photographer"; the picture of the country horses is published by permission of the Autotype Fine Art Company, Limited.

## FRIENDS IN SCOTLAND'S FARTHEST NORTH



**"VIKINGS"—THE SPLENDID TYPE OF HORSES IN THE NORTH OF SCOTLAND**  
From the painting by Edwin Douglas, by permission of the Autotype Fine Art Company, Limited.



**SHAGGY COMRADES—THREE LITTLE PONIES FROM THE SHETLAND ISLES**  
From a photograph by W. Reid.

of tame horses grew up about the rude dwellings of our savage forefathers.

But it was long, long after this that the horse was put to use. The cave dwellers who lived about fifteen thousand years ago, made pictures of the hognosed horse, on pieces of bone and on the walls of their caves. Some people have thought that some of these pictures show traces of a primitive harness, but this is not likely. It is now thought that the Libyans, who lived in the north of Africa, were the first people who learned to use the horse. It is believed that these people trained the beautiful North African horses to draw chariots, and used them in battle against their enemies, four thousand years ago, or more. The Egyptians owned horses at an early date, and used them in the same way as the Libyans. Indeed, it is believed that they got them from the Libyans. About the same time the Assyrians began to use the horses that came from Asiatic steppes, but it is thought that they were trained, and brought down for the Assyrian armies by tribes who lived further north. These people are thought to have been the first to learn to ride the horse, and this is all the more likely to be true because their descendants, the Turcomans and Mongols, have always been noted horsemen.

Before they got the horse, the Assyrians had tame donkeys, and so had the Babylonians and the Egyptians. We read in the Bible, in the ancient book of Job, that Job had a thousand donkeys. Abraham had large numbers of them, and it was donkeys which the sons of Jacob brought down to Egypt to carry back the grain that was to save them from famine. Probably they were used to carry burdens on their backs much as they are used in our Western mountain region, under the name of burros. The donkey, however, though it is patient and willing, has not the intelligence or the strength of the horse, and has never been held in the same honor.

Once the horse had been trained for battle, it was soon found that a nation that had no horses could not hope to stand against a nation that had them, and the use of chariots and of cavalry in warfare soon spread. The Egyptians do not seem to have known how to ride, but the Assyrians both rode and drove, and both these people have left us records of

their horses on their pictured walls. These show that Egyptian horses were fine, like the Arabian horses, while the Assyrian horses had the heavy head, and short, stiff mane of the Asiatic horse. The Greeks, who loved horses, had both kinds. Their poets sang about them, and their sculptors made some of the greatest sculptures of horses that have ever been known.

By the time of the Romans, all the peoples of Europe had horses. Even in Britain Julius Caesar found, to his cost, that the people had numbers of horses and chariots. How these horses reached Great Britain and Ireland is not known. They were probably taken across the Channel and the Irish Sea in open boats, just as the Norsemen afterwards brought their horses to far-off Iceland.

The British horses spread northward through the islands. In the south they were quite large; but in the north, where living was hard, and fare poor, they became stunted, and their coats grew long and shaggy to protect them from the winter cold. In this way a new type of horse arose, and from them have come the dear, shaggy little Shetland ponies that children love.

#### WHERE THE ARAB HORSES WERE FIRST FOUND

You will notice that all this time we have said little about Arab horses, and this is because there were none. There were wild donkeys in Arabia, but no horses, until they were brought over from Africa, less than two thousand years ago. They thrived in Arabia, however, and when, centuries later, the Saracens set out, from Mecca, on their career of conquest, they had plenty of swift, strong horses, and were able to sweep everything before them.

The Arabians tried to keep their beautiful horses to themselves, but in the seventeenth and eighteenth centuries, a few were brought to England, and it is from these that the beautiful English thoroughbreds and hunters have come. Our thoroughbreds were originally descended from the English thoroughbred, but lately some Arab horses have been brought to the country direct from Arabia.

And now we must go back a little way to find out the origin of the powerful drayhorse. We owe the drayhorse to the agency of man, and originally he was not meant to be a drayhorse. In the days

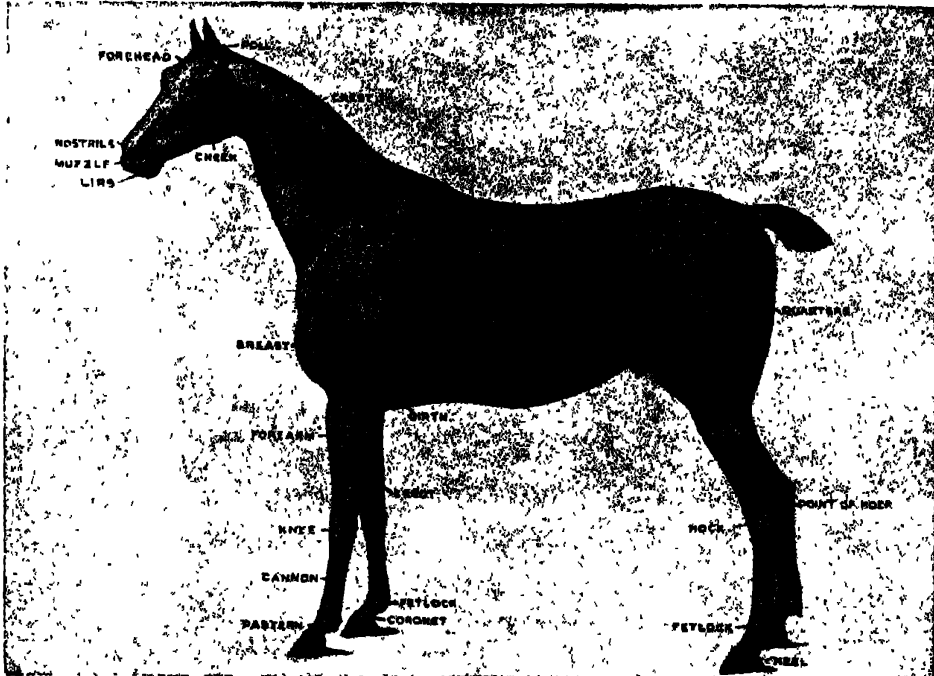
OUT FOR A WALK WHEN THE WIND BLOWS



"AN APRIL DAY"—BY LUCY KEMP-WELCH

of chivalry, when knights rode to battle, or in a tourney, covered from head to foot in armor, it was no small steed that could carry them. So they began to breed more and more powerful horses, that could carry mail-clad riders and their armor as well. In time of peace, or on a journey, the knights rode on small horses, called palfreys; but when the hour of battle came, they mounted their great war horses. Charging at a gallop, they met together with a mighty

fine horses of which they were expert riders, and troops of beautiful wild horses roamed and galloped over the plains? They came by sea, and the Spaniards brought them. The knights and men at arms would not think of fighting on foot. The Spaniards knew they had much fighting before them, and they actually brought their horses over in their uncomfortable, inconvenient ships. Some of these horses escaped on both continents. They multiplied rapidly, and the



THE DIFFERENT PARTS OF A HORSE AND THEIR NAMES

clash of lance on armor, and many a knight and horse went rolling on the field never to rise again.

When the wars were over, or when they were too old for battle, these heavy horses were used to draw the plough. When carriages first came into use they were very heavy, clumsy affairs, for which strong, heavy horses were needed. As better roads were made, heavy drays and wagons came into use, and magnificent Clydesdales, Percherons and other powerful horses were used to draw them.

#### HOW THE HORSE CAME BACK TO AMERICA

Now some reader asks, if all the American horses died out, how was it that, when the West was settled, the pioneers found that the Indians of the West had

troops of Indian ponies and mustangs that the pioneers found were their descendants.

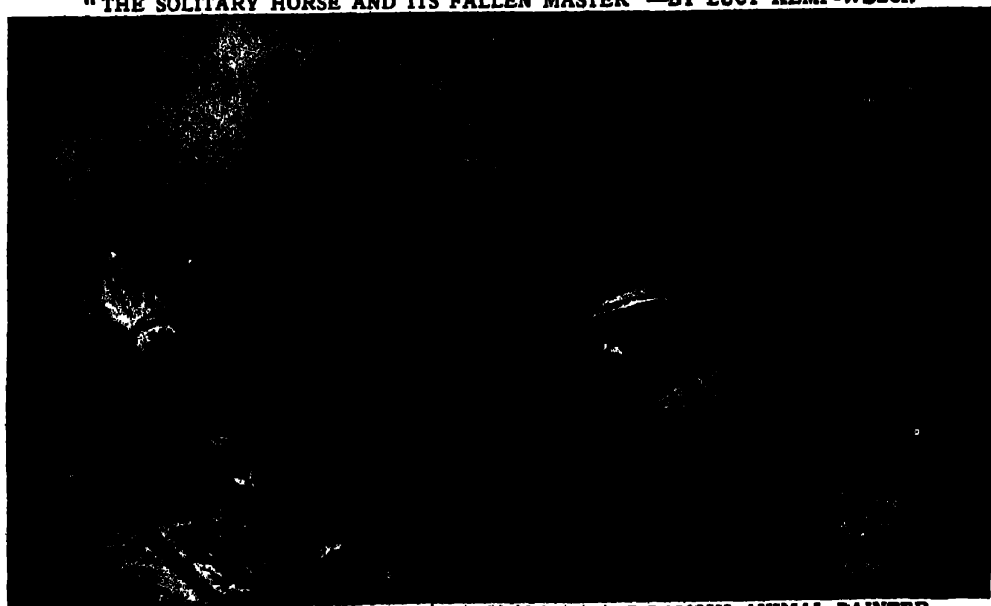
From the names of the various kinds of horses we can tell pretty well where the different types have been developed. The Clydesdales, of course, came from Scotland, the Suffolk Punch from England, the Percherons from France. Belgium is famous for heavy horses. Ireland has long been noted for fine hunters, and England for race horses. Apart from the descendants of the wild horses the horse that is most distinctively American is the trotter, a light horse that trots very rapidly. It is usually harnessed to a sulky or a light wagon, and covers the ground with amazing speed.

THE NEXT NATURE STORY IS ON PAGE 6241.

## THE MORNING AFTER THE BATTLE



"THE SOLITARY HORSE AND ITS FALLEN MASTER"—BY LUCY KEMP-WELCH



A FAMOUS PICTURE BY LANDSEER, ENGLAND'S MOST FAMOUS ANIMAL PAINTER  
These pathetic figures of the war-horse—the innocent sufferer in man's quarrels—are by the greatest English animal painter of the past and the greatest English horse painter of to-day.



## WHERE THE MISSISSIPPI IS CHAINED AND SET TO WORK



At Keokuk, Iowa, the course of the Missouri up, now grown to be a large stream, is checked by one of the great dams of the world though not one of the highest. From the Illinois shore in the background the concrete dam stretches over four fifths of a mile to the power house in the centre and then turns down stream toward the locks you see to the right, through which vessels may pass. The plant can deliver 120 000 horsepower, and it will be possible to increase this amount considerably.

Photograph by Anschütz

# The Book of THE UNITED STATES

## WHAT THIS STORY TELLS US

**T**HIS story tells how the great Mississippi River, the longest river in the world, is born in a little lake in the hills of Minnesota, and flowing down through the heart of the American continent some 2,500 miles, empties at last into the Gulf of Mexico in the south. Many large towns and cities are built upon its banks, chief of which are St. Paul, Minneapolis, St. Louis, Cairo, Memphis, Helena, Vicksburg, Baton Rouge and New Orleans. The river flows through the richest bottom land in the United States, extending as it does over thousands of miles, where corn and wheat and cotton and sugar-cane and many other important crops are grown. The Mississippi River was first discovered by De Soto, and later explored by Joliet, Marquette, and La Salle, and was then in turn under the control of the Spanish and the French. The complete control of the river came to the United States with the Louisiana Purchase in 1803.

## THE MISSISSIPPI

**T**HE Mississippi River has been called the "main artery" of the United States. Like an artery in a man's body it pulses through the very heart of the American continent, receiving its water supply from the many tributaries that run like giant veins into every part of our broad land. From the source of its chief tributary, the Missouri, to its mouth is 4,200 miles, making this great stream the longest river in the world.

But if you will take your atlas you will see the real source of the Mississippi River proper is not with the Missouri in the Rocky Mountains, but in the hill country of Minnesota near a little group of lakes. For a long time Lake Itasca was considered to be the source. There are many lakes in the neighborhood, all connecting, though the reeds and the grass sometimes hide the little streams which join them together. Men who have surveyed the whole park now think that Little Elk Lake, seven miles beyond Lake Itasca, is the real source. The water passes through Lake Itasca. It is a pretty little lake encircled with green forests and often the tremulous laughter of the loon drifts over its quiet waters. In certain spots the water is broken by the lush, green grass of the rice that pushes its way up from the rich mud bottom. The stream that

CONTINUED FROM 5969

leaves the lake is no more than a creek, and is about twenty feet wide and two feet deep, and seems not an unworthy beginning of the mighty river it is to become..

As the river pushes on its way it becomes broader and more tranquil, but when it arrives at St. Paul and Minneapolis, the great manufacturing cities of the northwest, it is still a very moderate sized stream. At Minneapolis the river takes its first foaming leap over the falls of St. Anthony and for a little way the waters become a thunderous, roaring, impressive torrent.

Between the sturdy bulwarks of the Minnesota and Wisconsin bluffs the river makes its way. It is a lovable stream here, clear and swift and cool, unmuddied by the tearing of the banks on the broader river below. Below, the bluffs are wider apart, and the river swings first against one and then against the other. Between the river and the bluffs the land is covered with trees, principally natural oak woods, poplars, beeches, elms, maples, and willows, with farmhouses hidden here and there among the trees. These houses, on the whole, look prosperous.

**T**HE RIVER IS HARNESSSED AND  
MADE TO WORK

In Iowa the beautiful farming country rolls away on either side. At

Keokuk a wonderful dam to supply power has been constructed. This is one of the largest dams in the world, though not one of the highest. It furnishes much water-power. At Hannibal, Missouri, beside the growing river, we come to the country of Mark Twain. Here, great rugged bluffs rise along the water edge, and beyond the green, dotted pastures roll away to the hill country inland, where there are farmhouses, and churches and patches of forest trees. "The house the humorist lived in still stands and is much the same as it always was—a stumpy, two-story, clap-boarded dwelling." You can find also the "hill where Tom Sawyer and Huckleberry Finn used to dig for treasure with much enthusiasm, expecting to find a brass pot with a hundred dollars in it, or a rotten chest full of diamonds."

#### WHERE THE MISSISSIPPI AND THE MISSOURI JOIN

About twenty miles above St. Louis, the Great River receives the water of the Missouri, itself an immense river, and larger than the Mississippi River to the point where they join on their way to the Gulf of Mexico. Soon we see no more of the high bluffs for a time, but the river runs through the flat lands.

From the city of Cairo, Illinois, to the Gulf, the river is generally higher than the land which lies away from the stream. It has built a bed and banks for itself out of the vast quantities of mud, sand and silt it has brought down from above.

#### THE TREACHEROUS CURRENT OF THE RIVER

From here on, the current of the Mississippi is a thing to be reckoned with. "To the landowners of the river valley the waters seem a very demon of destruction, eating away the banks and flooding the low-lying farmlands, sweeping all before its swift, silent current. In the flood season, landholders on the river never know but they may awake one morning to find their fair acres a swirl of thick brown waters. One traveler through the Mississippi valley says that a hotel proprietor told him there was a 'heap of pretty country under water along the river' and one day he made a trip to an outlying village to see how the people fared in the submerged districts. They took the flood philosophically enough. He found they were in no danger, simply inconvenienced. Some of the land and

houses had not yet been touched, but the majority of the dwellings were quite Venetian and he hired a negro to row him about among them."

#### THE DREADED FLOODS AND THE LEVEES TO HOLD THEM BACK

To prevent these devastating floods the people have built up levees all along the banks, great earth walls, to keep the giant river back within its natural bounds. Along these levees, roadways are built in some places and back of them pleasant homes, neat and cosy and clean, with vines and shrubbery and shade trees growing about them. Sometimes the river rises above them, or one of them breaks, and then the whole face of the earth is covered with water.

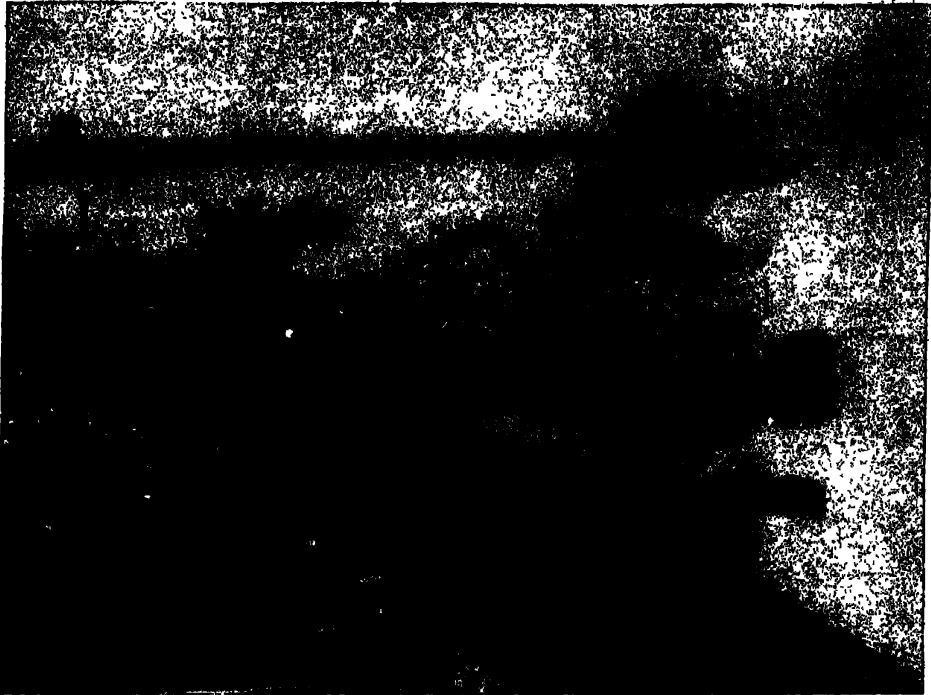
To one class of the Mississippi people, however, the floods hold no terror,—the boat-dwellers; for them the river is a great everchanging highway, a bountiful fairy dream, full of change and fascination. From the logs afloat upon its surface they gather the wherewithal to build their homes. All the way from St. Paul to New Orleans, thousands of the water gypsies can be found, in all sorts of houseboats, varying in size and material according to the means or whims of the owners. Some of them are no larger than an ordinary skiff, with hooped-iron roofs covered with canvas, under which the people crawl for the night, while others are large, comfortable, and attractive. Sometimes they can be seen in flotillas of a score or more; at other times only two or three can be seen.

#### WHERE THE OHIO JOINS THE RIVER

Cairo stands where the great Ohio River from the east joins the Mississippi, and no end of steamers, scows, rafts, tugs, houseboats, and skiffs float up and down. With such towns as this the river banks are studded. The air is filled with a sort of lazy hum of life and excitement. The Ohio carries down much water, and it too is subject to floods. It brings water down from the western slopes of the Alleghanies, and often raises the level of the Mississippi itself.

Kentucky first, and then Tennessee are on the east bank, and Missouri and Arkansas on the west. In Tennessee wide expanses of corn and cotton fields stretch away from the waters. In some seasons of the year the fields are alive with negro workers, hoeing the corn and cotton or

## TWO VIEWS OF THE MIGHTY MISSISSIPPI



Though the Mississippi is one of the longest rivers in the world, it is not one of the deepest. In many places it is so shallow that a special form of boat has been constructed with the paddle-wheel at the back protected from snags and floating logs and not extending deep into the water. Such a boat can go where the water is very shallow. Notice also the levees which keep the river in bounds, here used as wharves.



The people of the Mississippi Valley are very much interested in the construction of a deeper channel, hoping that the commerce of the region may be increased thereby. In order to interest the national government a great excursion carried President Roosevelt and many other prominent men down the river, just before the end of his term of office. Here we see the procession of the boats. To-day the railroad along the river carries more traffic than the river, which it is planned to increase in the future.

picking the white fluff balls out of their round bolls. In the autumn when the bolls open the cotton lands along the Mississippi look as if they were white with a fall of snow.

As the river flows lower and lower in its course, the volume of its broad waters grows greater and greater. It washes away hundreds of acres of plantation lowland every year, sucking the silt from its sides, and hurling it onward and downward toward the sea.

Along the lower reaches of this river, the banks become farther and farther apart until to people standing upon one bank the other seems but a hazy line of blue across the swift, turbid waters. In the fall, the broad stream is alive with river schooners piled high with blue molasses barrels and bales of cotton; seen in the hot sun against the clear sky the cotton-piled steamers seem like floating mountains of white snow. In the fore-castle of the boats can be seen the throngs of negro workers, the handkerchiefs bound about their heads flaming gaudily against the snowy background of the cotton bales.

As the boats push their way up and down the muddy stream, their great smoke-stacks puffing out clouds of white vapor, they stop now and again at some levee along the shore. Then the air is filled with a clamor of banging barrels and oaths, as the negroes, under the direction of the foreman, load and unload the cargoes. The bodies of the toiling negroes glisten as if they had been oiled. The boats move slowly along from landing to landing, between monotonous naked walls of mud, rising sometimes as high as fifteen feet above the upper decks.

The army engineers are constantly struggling with the river. In some places it is too wide to give a safe passage for steamers, and here they narrow it. They build levees to keep it back, they strengthen banks to keep the river from eating them away. They pull out the trees it has drowned, so that they will not tear holes in the boats as they go up and down.

The last part of the journey is through a region almost tropical in appearance. The river twists along and from the upper deck of a boat paddling down stream one may see the variegated water-birds in the swamps behind the levees, and tall cypress trees festooned with Spanish moss

waving in the breeze and rising out of a real jungle of undergrowth. It is like another country.

As the river nears New Orleans, houses suggestive of thrift and prosperity spring up along the shore, and pretty white villages nestle among the tall trees. Here and there can be seen white-washed beams and sheds, negro cabins and hen coops, with broad sugar and rice fields rolling away behind them.

## NEW ORLEANS, THE CRESCENT CITY, AND THE RIVER

At last the great river curves around the high-built levees and wharves of New Orleans, the Crescent City. Like New York City, New Orleans is one of the great commercial gateways of our continent. Even the river itself seems dwarfed by the monster steamers that plough its "dun waters." Old, bulky ferry boats, huge river dredges, and fruit vessels from the West Indies, Mexico and South America make their way to and fro; and in and out among them all push the slim, white Mississippi packets, looking like giant swans upon the turbid waters.

"Some classes of goods go at once into the warehouses, trains, or vessels, but others are stacked for a longer or shorter time on the wharves. There are vast quantities of great, clumsy cotton bales, rows of oozy molasses barrels, heaps of raw sugar in coarse brown bags, piles of lumber, great, odorous hogsheads of tobacco, and boxes and crates and bales of a thousand shapes and a thousand variations of contents. But cotton is more important than anything else, for New Orleans is the greatest cotton port in the world, and the storing, selling, and handling this product furnishes a livelihood to the majority of the city's three hundred thousand inhabitants."

The city has nearly 400,000 people now. It is not at the end of the river, for the city is many miles from the mouth, or mouths. The river sweeps on, without heeding the great traffic of the Crescent City, and empties its silt-laden waters into the Gulf of Mexico, lying placid and deeply blue against the southern sky. The "Great River" builds its mouth out far into the open Gulf, dropping the silt it has carried as it meets the salt water of the sea.

THE NEXT STORY OF THE UNITED STATES IS ON PAGE 6135.

## THE MIGHTY RIVER FLOWS SOUTHWARD



In its upper course the Mississippi runs through a wide valley, which is confined by high bluffs. These are usually at some distance from the river, though in its windings it may come close to them in some places. This is Lake Pepin, seventy-seven miles below St. Paul, and is so called because the river here widens out into a sort of lake twenty-five miles long. The scenery along the stream is varied.



Several hundred miles below the scene shown above evidences of man's presence become common and the mighty river has many cities and towns upon its banks. This is a part of the river front at Quincy, Illinois, a prosperous manufacturing city, as you can see from the many chimneys with their plumes of smoke. Pictures from Brown Bros.

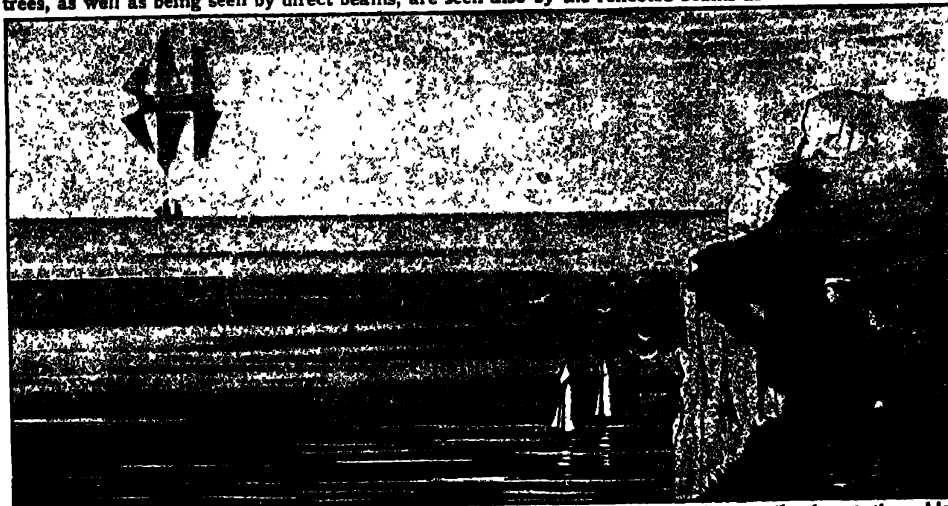
## SEEING WHAT IS NOT THERE



In this picture we see a mirage in the desert, a scene which does not really exist at all, but is actually a reflection. To the thirsty and weary travelers there appears to be water, which afterwards disappears.



This diagram explains the mirage. The layer of air, A, next to the hot sand, is warm, and different layers of air above, B, C, and D, have different temperatures, and therefore different densities. Now, beams of light passing through gases of different densities are refracted in varying degrees, and, as shown here, the trees, as well as being seen by direct beams, are seen also by the reflected beams as if reflected by water.



This picture shows a mirage at sea, where the conditions are the opposite of those in the desert, the colder and denser air being lowest. The light rays from the ship strike upon layers of different density in the upper air and are refracted downwards. When the densities vary much, images will be seen, some of them inverted.

## THINGS TO MAKE AND THINGS TO DO



### HOW TO ARRANGE A PAPER CHASE

THERE are few more healthful or enjoyable ways of spending a half-holiday than in running a paper chase. It is quite easy to get out a little way into the country from any big city by train, trolley, or motor car, and a good cross-country run cannot but be of benefit to any boy.

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Any number may take part in a paper chase, and a dozen would be a very good average number. Two of these represent hares, and the remainder become hounds. The method of playing is, of course, for the hares to run off across country, taking for preference a route not known to the hounds, and scattering torn shreds of paper as they run. A certain start—about ten or fifteen minutes—is given, and then the hounds go off in pursuit. Their object is to catch the hares—who, of course, keep together—and they follow the route by tracing the paper that has been laid. Obviously it is not wise to run on a windy day, as the paper is blown away and the track lost. In order to confuse the scent the hares often lay a false trail, which, after running some hundreds of yards, simply ceases. When the hounds reach the point where two trails diverge they often lose precious time by deciding upon and following up the wrong one. When it breaks off there is nothing to do but go back and follow the other.

The most suitable clothes in which to run a paper chase are: A sweater, such as is used for football, and flannel trousers.

Canvas or leather shoes, with plain leather soles, should be worn.

A large quantity of paper torn up beforehand, and packed in large canvas bags, which are slung in satchel fashion round the body. Each hare can take two bags if the run is to be a very long one.

Those who are going on the paper chase should get to bed in good time at night, for nothing spoils the running powers of a

young athlete like late hours at night. It may be tempting to sit up late, but we shall surely suffer

if we do so. Our muscles will not be what they should be, and our wind will fail us when we come to run over a long course.

For it must be remembered that a paper chase is not like a mile or half-mile race on a specially laid track. The man who can sprint a mile in fine style and record time is often no good for a long cross-country run. Speed is not the only essential. Staying power is most important, as we realize in a very true sense when first wind has gone. But if we are in fit condition, when second wind comes we get into a good stride and go along well.

The hounds should keep well together, in the early stages of the game, at any rate; it is quite a good plan for them to run in pairs as well as the hares. They can often help one another if they should get into difficulties or in the events of the run. For instance, in following up the two trails to discover which is the true one, a boy to each is enough and will save valuable time. Moreover, two pairs of eyes are better than one, and if the scent is blown away or hidden for a time it is likely to be more quickly picked up when two are seeking it. When they come in sight of the hares, each pair can see which shall have the honor of actually touching the hares first.

Sometimes a paper chase is run over routes that have not been traversed before, and in districts that are unknown to the runners. But as a rule the hares go over the course first, taking note of its opportunities and the lie of the land. It is important for them to know that they can find cover, and not be visible for long distances ahead. Then, too, they will try to make the home run as easy for themselves as possible.



## GAMES TO PLAY IN THE TRAIN

IN the summer months most of us go for a holiday to the seaside or to the woods or mountains, and some of us take long journeys in the train that get very tiring unless we can find something definite to do to pass the hours. We cannot read all the time, and even if we have an inside seat we get tired of looking aimlessly out of the window. Even if there is a party of us, conversation flags after a time, and we long for our journey's end. And yet we need not get tired in the train for lack of something definite to do, for there are all kinds of games that can be played when we are tired of reading or of looking out of the window, and these will prove very interesting to the traveler as he speeds along mile after mile through the country.

### THE LOOK-OUT GAME

AN excellent game for boys and girls, and one that develops our powers of observation, is to look out for objects in the fields and roads as we pass by in the train. Marks may be awarded for each object seen, and named, and different values may be given to different objects. Thus, to see a field with cows in it might be worth five marks, and a field with pigs ten marks. A church might be equal to three marks, and so on. If one of the competitors guesses that some distant object is a cow, and upon a nearer view it proves to be a sheep, five marks should be deducted from his score.

Marks should be awarded only to the competitor who first sees any particular object; that is, two competitors cannot each receive marks for the same church, or cows, or reaping machine, or haystacks, unless, of course, they should both call out the names at the same moment, when the marks would be divided equally between them.

The number of marks for each of the familiar objects of the countryside—cows, sheep, pigs, horses, ploughmen, reaping machines, churches, villages, ponds, rivers, streams, windmills, rooks, dogs, open gates, closed gates, farms, and so on—must be decided before we begin the game, and this provides plenty of occupation while we are passing out of town on the way to the country. In allotting marks to different objects, we should give the largest number to objects least likely to be seen, and the most familiar objects—such as churches, fields with cows, and so on—should receive the fewest marks. If the players sit at opposite sides of the car, and look out at the country on opposite sides of the train, the fun is more exciting than if all are looking out at one side; but we must take care not to annoy other passengers.

### THE HOLIDAY A B C

A GOOD game for the train, and one that is quite appropriate to holiday-makers, is what may be called the Holiday A B C. Having decided who shall begin, a player gives quickly the name of some holiday place that begins with A. Then the next player asks: "What shall you do there?" And the first

player must give an appropriate answer, every word in which begins with A. Then the second player gives the name of a place beginning with B, and the third player asks: "What shall you do there?" to which number two must answer in a sentence of words beginning with B; and so on. Thirty seconds only are allowed for an answer, and those who take longer are given one mark for each second that they take over the thirty. At the end of the game the player with the fewest marks wins. Of course, after getting to the end of the alphabet, we can begin again, and give fresh places, if we are not tired of the game. The letters X and Z should be left out, as they are too difficult. Here are one or two specimen answers: I am going to the Adirondacks. What shall you do there? Attempt almost anything. I am going to Bar Harbor. What shall you do there? Breathe briny breezes. I am going to Coney Island. What shall you do there? Catch crawling crabs.

### A STATION GAME

ANOTHER good game which exercises the powers of observation, and at the same time provides plenty of excitement and fun, can be played after we leave any station which is a stopping-place. While the train is standing in the station all the players look about, and take as much notice of things as possible. Then, when the train has left the station, and five minutes have elapsed, we take it in turns to name any object that we saw at the station. Of course at first this is very easy, and we can go round and round again, each player naming one object which no other player has mentioned. But as the game goes on, it becomes harder and harder to think of things that were at the station, but have not already been mentioned by other players. The one who is last able to mention an object that no one else has thought of wins the game.

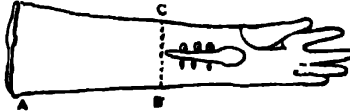
### A LONELY TRAVELER'S PASTIME

OF course, if we are traveling quite alone we cannot play any of these games, but we need not find a railway journey long and heavy on our hands. In such a case we should see to it before we start that we provide ourselves with a map of the route. Really good maps, showing all the interesting points, buildings, roads, and so on, on a very large scale, can be purchased for a few cents, and with one of these we can follow our route very closely.

If we have not been able to secure a detailed map of the journey, we can always get a railway time-table, and follow the route in the map of the line which is given in the time-table. In this case we shall find it very interesting if we fill in as many details as possible ourselves as we go along, putting a cross wherever a church occurs, a feathery mark for hills and rising ground, squares for farm-houses, circles for ponds and lakes, and other distinguishing marks for objects of interest.

## HOW TO MAKE A BAG FROM A PAIR OF GLOVES

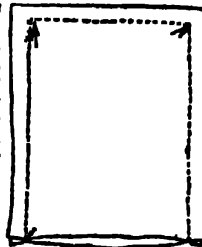
IT is easy to make a dainty leather bag out of old kid gloves. The gloves must be elbow length, or longer, because it is the "tops" that we are going to use, because although the fingers wear into holes, the tops always remain quite good. We shall have to ask one of our grown-up friends for a pair she has finished with, and, if she has several pairs, we will choose the darkest color. Tan, brown, navy blue, or black are good shades, because they do not soil; and as we wish to use our little bag as a purse, this is a consideration. Of course, if white gloves are available, we can make a small bag for quite a different purpose—an evening bag, just big enough for a handkerchief and a few little odd things when we go to the theatre or to a party. We notice that there is a seam down one side of the glove-top. With a sharp pair of scissors we cut down that seam—as from A to B in picture 1—then we cut right



1. HOW TO CUT THE GLOVE

across the glove nearer the wrist—as from B to C—and open the piece out flat. This will make one side of our bag, and of course we get the other side in the same way from the other glove. We must be very careful to cut our two gloves quite even. We lay these pieces together back to back, and cut them straight, and we shall get two pieces each seven inches square. If they are big gloves we shall get a larger piece. When we have the outside ready we must think about a lining for our bag. A little strip of satin, silk, or wide, soft ribbon will do admirably. It should be of a contrasting color, or a good match. For instance, our tan kid bag would look well lined with green or brown; if navy, lined with violet or mauve; if black, lined with white or scarlet. For the white bag it will be best to select a delicately colored lining—pale pink, palest blue, or white. These are only suggestions. We can, of course, choose for ourselves the color which pleases us best. We may wish it to match a friend's dress or hat. If there is a "piece-box" in the house there will certainly be several pieces to choose from. We also need a yard of silk cord, the color of our lining, for the handle and the "draw-up."

Having cut our lining a little larger than the kid, we must first run round three sides of it with the stuff laid *face to face*—see picture 2. The fourth side we leave open. Now take up

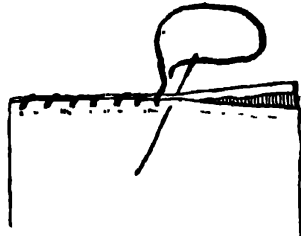


2. THE LINING



3 THE FINISHED BAG

the kid, put the pieces *back to back*, and sew round three sides—these stitches are to show. If we look well at picture 3, which shows the finished bag, we shall see how the ornamental stitches are managed. The kid has been turned in once, and a stout thread of embroidery cotton or coarse silk of the same shade as the lining has been used to sew the two edges together, over and over, all round the three sides. Care must be taken to keep the stitches as even as possible, and fairly big. When the three sides are done we slip the lining inside, just as it is, and turn in the edges of the kid and the satin at the top, or opening, of the bag, so that they fit together nicely, and then sew them over and over in the same way as the sides were sewn—see picture 4. Next we make a slot for the cord to run in, by a double row of stitching across the top, leaving about  $1\frac{1}{2}$  inches for the frill. The slot should be half an inch wide, and must be neatly back-stitched top and bottom. We have now only to work a couple of eyelet-holes at each side, insert the cord with a bodkin, and the bag is finished. If our bodkin-eye will not take the cord, which is generally a trifle too stout to go through, we should sew the cord to the bodkin-eye with a piece of thread. The bag will open and shut more easily if we run the cord round twice instead of once. Then we are able just to give each handle a gentle pull, and the mouth of the bag closes automatically.



4. SEWING OVER AND OVER

We need not, of course, keep to the square shape for our bag, for by wasting a little strip of kid we can get an oblong shape, which can be made just as useful. For instance, a bag made of black kid could be lined through with a piece of velvet and made just large enough to hold a pair of spectacles. This size is best made to fasten with a little pointed flap. On the bag we sew a glove-button, and to the point of our flap we make a loop of several threads of silk.

A leather case made in the shape of an ordinary envelope is useful to anyone who goes fishing. If lined through with a strip of oiled silk, it makes an excellent holder for flies and fine wire. This case should be fastened at the point of the envelope flap, in the same way as the bag for a pair of spectacles mentioned above.

For instance, keep to the square shape for our bag, for by wasting a little strip of kid we can get an oblong shape, which can be made just as useful. For instance, a bag made of black kid could be lined through with a piece of velvet and made just large enough to hold a pair of spectacles. This size is best made to fasten with a little pointed flap. On the bag we sew a glove-button, and to the point of our flap we make a loop of several threads of silk.

## LITTLE GARDENS FOR INVALIDS

### HOW TO STUDY NATURE IN A BEDROOM

THERE came to my desk the other day an interesting letter from "A Shut-in of Many Years Standing," a touching letter, which set me thinking of the hundreds of boys and girls and grown-up readers of this book who spend their lives indoors, lying cheerfully and patiently all their days in bed or on a sofa, and complaining not half so much as some of those who live in health and strength. Here is a letter from an author, Miss Phoebe Allen, who has written many little story-books for children. She herself is an invalid, and knows what pleasure an indoor garden gives, and has written you a letter to tell you what you may grow in your own garden in the house. She writes:

"Do you think there are any invalids among your readers, boys and girls who can never go out of doors? And do you think

you could find room for a letter from a fellow shut-in, telling them how they may work at a garden in their own room? And how, besides raising ordinary plants, they may cultivate all manner of delightful rarities, such as orange and lemon trees, date palms and pepper plants, oak, laburnum, and walnut trees? And how they may make charming hanging gardens where, half-way between ceiling and floor, hyacinths and snowdrops will peep out of a globe of mossy verdure, and how even miniature lakes can be introduced into their pleasure-grounds and filled with water plants?"

Miss Allen has written us the story of her own indoor garden—though she has called it Roy's garden instead. Perhaps there are some Roes who *will* have gardens like Miss Allen's when they read about its quaint devices.

### THE STORY OF ROY AND HIS BEDROOM GARDEN

EARLY and late, Roy worked in his little plot of ground, so that when, owing to the results of a bad fall, he was condemned to lie in bed for many months, we all pitied him for the loss of his garden. But, instead of pitying himself, Roy set to work, with Dora as his assistant, to turn his room into a garden. As it was late autumn, Roy started with bulbs. Some were planted in bowls of coconut fibre; crocuses, gold and purple, went into shallow saucers; some pet hyacinths had separate glasses; while snowdrops and the glory of the snow had each their respective boxes. Roy's joy, however, was the two green leafy globes which hang in his window; they were real hanging gardens! Outside, they presented a mass of curling foliage, with golden daffodils gleaming in the centre of one, and hyacinths of every hue peeped over the rim of the other.

"And they were only jolly big turnips to start with!" laughed Roy, going on to explain how, after slicing off the root end, he had hollowed out two-thirds of each turnip—leaving their walls about one inch thick—and planted bulbs inside. "Then I hung the turnips up topsy-turvy, with their root ends turned toward the sky and their leaves pointing downward. But, just because Nature meant them to grow upwards, the leaves adapted themselves to their altered condition, and, turning toward the light, grew up all

round the outside of the turnip, making it a regular green nest."

Then Roy showed an oak in its earliest babyhood, growing from an acorn slung on a stick across a wide-necked bottle filled with water, an infant horse-chestnut, sprouting bravely under the same treatment; four dark-leaved alnut seedlings, standing some ten inches high in the little tub they shared together—they wanted all the sun they could get; a flourishing young almond, also a seedling; and, lastly, a Cornelian cherry and a laurel, both raised from cuttings.

"And these are my foreigners," he continued, indicating a box in which several small pots were sunk in sand, with two bits of glass laid over the top, but fitting loosely in order to admit air.

Here were orange and lemon seedlings—*pip-lings*, Roy called them—date-palms, one over a foot high, raised from stones, a crowd of tiny pepper-trees, scarlet chili, elephant's trunk, and golden dawn.

"And now look at this!" said Roy gaily.

With a cube of turf one and a quarter inches square, and sprinkled with spores of the oak, parsley and beech ferns, and set in a flat saucer with a little water and covered over with a bell-glass, Roy had created a most successful fernery.

But I must hurry on, without pausing to dwell on the cyclamen and cacti, the luchsias,



geraniums, and other usual window plants, which were all flourishing under Roy's care, for I want to speak of the delightful miniature garden laid out in a box. This was like a deep butler's tray placed on a table, measuring about thirty inches square, lined with zinc, with an inner perforated zinc tray to fit at the top, this being well concealed by a thick upper layer of soil.

It had a real grass plot and gravel walk, a thicket of fury roses—red and white, raised from seed—plots of pansies, double daisies, saxifrage and lobelia, miniature sunflowers, hipur nasturtiums, golden musk, dwarf mignonette, and clouds of sky-blue nemophila. Alpine fairies were there, too; while ivy geraniums hung over the walls of the garden.

"And now," said Roy, "look under that brown paper on the corner table over there; that's a great surprise for the little ones."

I raised the paper, and burst out laughing. Such a comical group met my eyes. There was a Jack-in-the-green sprouting mustard from every limb; a huge Teddy bear, with curly-leaved cross growing over him from the tip of his ears to his feet; while a very staid and solemn-looking mandarin, clad in a fine flowing robe of the new Chinese mustard, completed this trio of Greenlanders.

"It was nurse's idea," said Roy. "She took the baby's old toys and sewed them up in flannel, and then we damped them well and sprinkled them all over with the seeds. But we had to swing them on a line, you know, so that the mustard and cross would come up evenly all over, and now they're just perfect. I'm going to do a lot now for the children's hospitals. I shall do a whole Noah's ark, I think, and ships, and cannons, and all sorts of things," he added ambitiously.

## A NEW BALL GAME FOR THE OPEN AIR

THE difficulty of playing ball games in small gardens is that the ball so often goes over the wall and is lost, or, at any rate, interrupts the game. If we are playing in the city we have often to depend on the kindness of passers-by to return us the ball quickly before it is stolen. There is an interesting ball game in which the ball is fastened up so that it cannot go over the wall. We fix in the ground a long pole, and from the top of this we hang a strong, flexible cord or string. To the end of the cord, which, when it is hanging down loosely, should reach to within about two feet of the ground, we fasten any kind of bouncing ball. Two players stand at opposite sides of the pole, and, with tennis rackets or wooden pingpong bats, beat the ball from one side to the other.

The game of post-ball is to beat the ball so that the string will wind round the pole until it is all wound up, and the one who does this first wins the game. One player tries to wind up the ball round to the right, and the other to the left. Apart from the skill that is required, there is a great deal of fun to be had in striking the ball backwards and forwards.

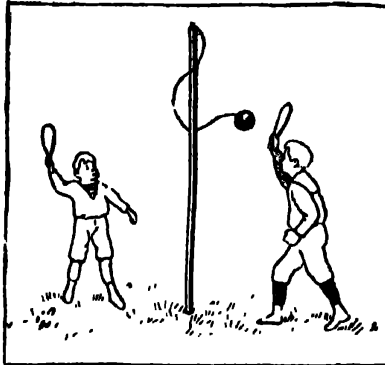
The skill comes in when we beat the ball in such a way that we make our opponent

miss it, while at the same time we are winding the string up for ourselves. On the other hand, we must try never to miss the ball ourselves; and when our opponent beats it round, we must drive it back, and thus prevent him winding the string round the pole. The game is most exciting, and its advantage is that it can be played in any garden. An ordinary tall clothes-line post will be a very good place to fix the cord, if the post is standing by itself sufficiently far away from trees and bushes and walls to give free play to the ball.

In order to fasten the string to the ball, it is best to make or buy a piece of strong string netting in which to place the ball, and the cord can then be fastened to this net.

Another way of playing is to have any number of players, who stand round the post at equal intervals and strike at the ball. The game is, as before, to wind

the string round the post, and all the players try to do this. Each strikes in turn, and if any hits out with the bat and misses the ball, he has to stand out of the game, until only one is left, and he is the winner. As often as the string is wound right up, it is unwound by beating the ball in the opposite direction, and the game is continued.



THE GAME OF POST-BALL

## HOW TO KNOW IF A RULER IS STRAIGHT

IT is quite easy by a simple experiment to discover if a ruler has a perfectly straight edge. We place the ruler on a sheet of paper lying on a smooth surface, and, holding the ruler down firmly, rule a line against the edge with a well-sharpened pencil. Then we turn the paper right round, and, placing the edge of the ruler close against the line already ruled, we hold the ruler down firmly once more, and

draw a second line along the edge of the ruler near the first line. If the edge of the ruler is not straight, the slightest inequalities will be seen clearly by looking closely at the two lines. There will be places where they are not the same distance apart, and, of course, the nearer together the two lines have been drawn the easier will it be to detect any irregularity. The ruler must not move during the ruling.

# A KALEIDOSCOPE THAT A BOY CAN MAKE

THE kaleidoscope is one of the most interesting of scientific toys, and there are few boys or girls who have not had one sometime. The name is made up of three Greek words which mean then "I see a beautiful image," and by means of the instrument, an endless number of patterns, all beautiful in form, and all different from one another, can be made. As a matter of fact, so far from being a mere toy, the kaleidoscope is sometimes used by artists and pattern-makers in order to obtain new designs and patterns for carpets, wall papers, and other fabrics.

The usual form of kaleidoscope, which was invented by Sir David Brewster in 1817, is a tube in which two mirrors are arranged at an angle to one another; and between these mirrors fragments of colored glass or other colored objects are free to move about as the tube is turned round. Whatever position these colored pieces take up, they are reflected in the mirrors, and the multiplication of the pieces by reflection forms a regular design which, however irregular the colored fragments themselves may be, becomes very artistic and pleasing to the eye. The slightest shaking of the instrument produces new figures.

But the tube, with its arrangement of mirrors inside, is not essential, and there is a much simpler form of the kaleidoscope which every boy or girl can make at practically no cost, and with very little trouble.

First of all we take a piece of white cardboard, fairly tough in substance, 4 inches by  $1\frac{1}{2}$  inches, and at one end of its greatest length we cut it to the shape shown at the top of picture 1. Then at A and B we cut small V-shaped nicks as marked in the diagram, and an inch from the bottom, at C, we cut a line  $2\frac{1}{2}$  inches long, with a little line measuring one-eighth of an inch at each end, at right angles to the longer line.

Then, on the opposite side of the card, with a penknife, we lightly score the cardboard along the directions marked by dotted lines in picture 1. This is done so that the card may be easily bent along these lines. The diagram shows exactly how we cut and score the card. The dotted lines are where we score—that is, cut only slightly into the card—and the black lines show where we cut right through. The card forms the body of the kaleidoscope.

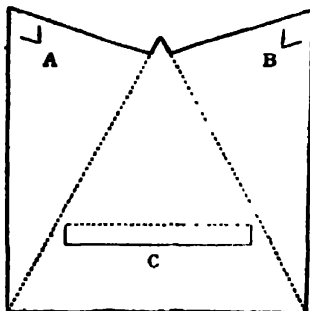
Now for the mirrors. We do not need looking-glass, but can use tin. We take two pieces of perfectly smooth and flat tin, 3 inches by  $1\frac{1}{2}$  inches, and, with any ordinary metal polish that may be in the house, we rub and rub these until they are burnished and shine almost like silver-plate and reflect nearly as well as looking-glass.

Now, with a slip of gummed paper, we join the pieces of tin by hinging together two of their ends so that they can be opened at any angle, as in picture 2, taking care, of course, that the paper is stuck on the dull sides of the tin, and not on the sides we have burnished so brightly.

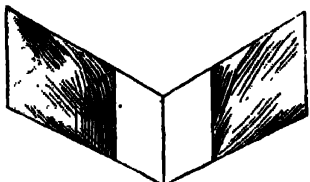
We are now ready to put our kaleidoscope together, and this is the way it is done: We first place the white card on the table in the position shown in picture 1, with the scored lines on the under side. Then we push up the little ledge, C, that we have cut in front, and turn up the two triangular flaps on either side along the scored lines, so that these will form upright sides. Now we take the folded metal mirror, and, opening it at an angle of about sixty degrees, we place it inside the card, so that the two nicks, A and B, in the cardboard sides come over the metal and hold it in position. The turned-up ledge in the front of the card will prevent the mirror from closing up, if we have measured its position correctly.

We now place some tiny pieces of colored cardboard of various shapes on the white card between the mirrors, and, holding the kaleidoscope as shown in picture 3, we let a good light fall upon the mirrors, when we see in them a beautiful design. As we shake the colored fragments about, the design changes with every movement. No matter how irregular the little pieces of colored card may be, a geometrical design will be formed, but this will be much more artistic and pleasing if the fragments of colored card are themselves cut into some regular shapes, such as circles, rings, triangles, s's, x's, and any others we care to make.

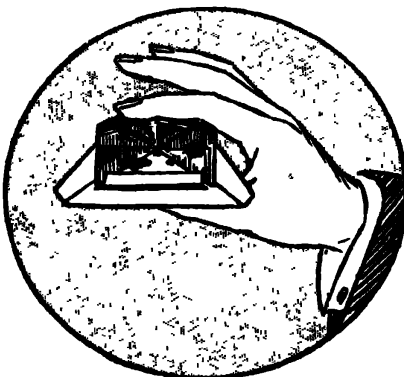
With a little practise we can cut cards to hold the mirrors at various angles, for according to the angle of the mirrors, so the number of times we see the colored objects reflected varies. Thus, when the angle is 120 we see the colored fragments three times; when the angle is 45 we see them seven times.



How to make the card.



How the mirrors are hinged.



The kaleidoscope complete.

## HOW TO MEASURE A STREAM

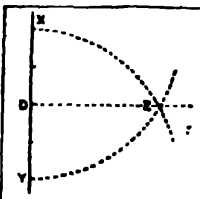
IT used to be thought that only a man who had served a long apprenticeship could do land surveying; but this is far from being the case, and any intelligent boy who cares to take a little trouble can find a great deal of interest and pleasure in measuring distances and heights, and even mapping out a stretch of country. What might seem one of the most difficult things to do—measuring the width of a wide river—is really quite simple, and will provide a very interesting occupation for boy scouts and others who like to get profit for the mind as well as pleasure for the body from a walk in the country.

The science of land surveying is a very ancient and honorable one, for it is supposed that it originated in Egypt, where it was necessary accurately each year to set up again the land boundaries washed away by the flooding of the Nile.

To measure the width of a stream we first of all choose a place where both banks are at about the same level and the stream is fairly straight. Then we select some tree or bush or stone, or other fixed object on the opposite bank, quite close to the edge, such as *A* in the picture. On our own side of the stream we mark off a straight line at right angles to the stream as at *B C*, in continuation of a straight line from *A* to *B*. This is done by placing a stick in the ground at *B* immediately opposite to *A*, and in moving back to *C*, taking care to keep the stick always exactly in front of the bush at *A*. We can mark the straight line *B C* by laying a string on the ground, if we have one, or by putting stones at short intervals.

Now from some point, such as *D*, not far from *B*, we mark a line *D E* at right angles to *B C*. To get the line exactly at right angles we

proceed as shown in the smaller diagram on this page. We measure off, say, two feet on either side of *D* in the line *B C*. This gives us the points *x* and *y*. Then we take a stick—a fairly straight branch of a tree will do very well—and holding one end at *x*, which we use as a centre, we describe an arc of a circle. Now

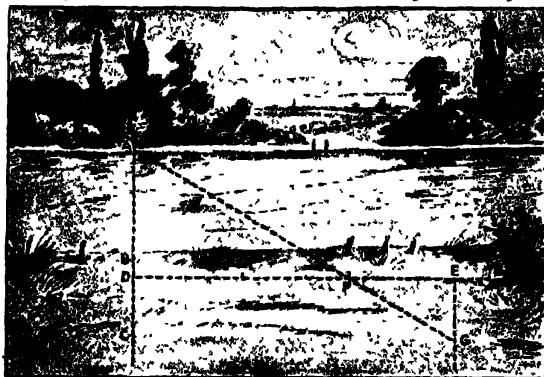


Making the angle.

putting the end of the stick at *y*, we again describe an arc, and the point *z* is where the arcs cut one another. At this point *z* we place a stick in the ground, and another stick at *D*, and then moving along so that in our vision we always keep one stick exactly in front of the other, we are able to mark the line *D E* as we did the line *B C*. *D E* should be measured to about 30 feet, and we should mark the point *F* at two-thirds the distance, that is, at 20 feet, and put a stick in the ground. Now from *E* we mark another line at right angles to *D E*, and we continue this till we come to a point *G*, where, looking across to our landmark on the other side of the stream—the bush at *A*—we see the stick at *F* exactly in front of it.

Now, with practically no trouble at all, we can find the width of the river, for we have only to work a simple proportion problem. As the line *E F* is to *F D*, so is *E G* to *D A*. *D E* is 20 feet, *E F* is 10 feet, and we will suppose that *E G* is 8 feet. Then our problem stands like this: As 10:20::8:*D A*—16 feet. From this figure we must deduct the distance *B D*, which we find, by measuring, is, say, 3 feet, and we have

13 feet as the width of the stream. This may not seem very interesting, but if the boys who read this page will try it for themselves they will find it a fascinating occupation. For practise we do not need a river; we can measure the width of a road or field.



An easy way to measure the width of a river.

## YOUR PORTRAIT ON A SHEET OF NOTEPAPER

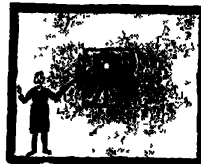
IF you want to have a joke with a friend, here is a very good way of doing it.



The drawing on the notepaper.

Take half a sheet of notepaper, fold it in two, so that the fold comes at the bottom. In the middle of this square draw a comic portrait inside a ruled space, measuring about 1 inch wide and 1 1/2 inches deep. Cut through the base and side rules, bend back the portrait, and on the paper showing through the opening draw a tripod camera. Then cut through the side lines

and the top line which coincide with the upper and side rules of the portrait, and pull the lower flap through so that it covers the portrait. On the left side of the front half of the folded paper draw a photographer in the act of pulling a string, which is carried across the cut to the lens of the camera, and the trick is ready, as shown in the picture. Face your friend, holding the folded paper in front of him, with your left hand gripping the front half and the right hand the back half. By a slight jerk backwards with the right hand, the comic face will be made to appear in the place of the camera.

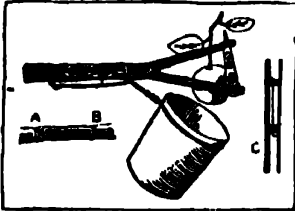


The trick ready.

# HINTS AND TRICKS FOR ODD MOMENTS

## AN EASILY-MADE APPLE-PICKER

IT is quite easy to make an ingenious apple-picker that will save us a lot of time and trouble when we are gathering the fruit in the orchard or garden. It spoils the apples to knock or shake them down, and it takes a long time to move our ladder about and climb all over the branches to reach every apple. But by means of the simple arrange-



ment shown in the picture we can gather the apples carefully and well. We get a forked stick, and across the fork we tie an old knife-blade, after sharpening the edge. Then we cut two small grooves in the stick, eight inches apart, as seen in the picture, at A and B. A long piece of fairly stout wire is then twisted round a tin can, and the end is wound round the stick in the grooves. We must be careful to fix our can so that it will catch the apples as the knife cuts them, or all our trouble will be lost. The apple-picker is then ready. If we want it very long, we can make the stick or pole as long as we wish by splicing it in the manner shown at C, binding round the join with wire.

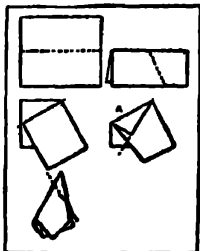
## THE RABBITS' EARS

IF we were asked to draw three rabbits, and to give them only three ears between them, yet to make them appear as though they really had two ears each, no matter how clever we might be as artists, we should think that an impossible and ridiculous task had been set us. Yet such is not really the case, for, as can be seen by this picture, the drawing can actually be made and the conditions fulfilled. By a skilful arrangement of the three rabbits and the three ears, as shown in the picture, the little animals appear to be quite properly equipped with the right number of ears, although they have only three between them.



## A STAR MADE WITH ONE CUT

IT would at first thought seem to be quite an impossibility to cut a five-pointed star out of



a square of paper with one single snip of the scissors, and yet it is quite easy to do so. Everything, of course, depends upon the method of folding the paper before cutting, but if the square of paper be folded exactly as shown in the accompanying diagrams, and then the folded paper be cut with one snip in the direction of

the dotted line in the fifth diagram, we shall

have a star. In folding the paper at the stage shown in the fourth diagram, so as to get that shown in the fifth, we must fold from the point A across to the right. In all cases, fold across the dotted line—that is, when you have the paper opened out flat, as in diagram 1, fold across the dotted line to make diagram 2, then, to get the shape shown in diagram 3, fold across the dotted line in diagram 2, and so on to position 5.

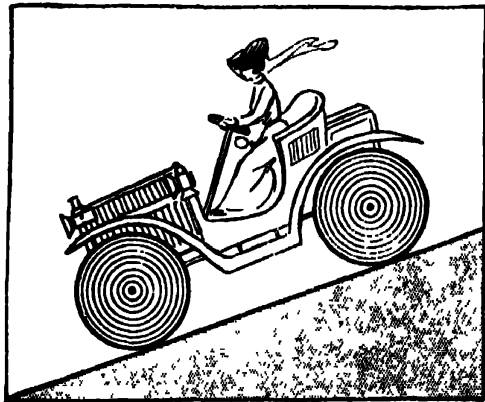
## THE MAGIC WRITING

WE can have some fun with our friends by causing what seems to be magic writing to appear upon the surface of an ordinary looking-glass when it is breathed upon. Unknown to our friends, we write upon the glass with a piece of French chalk, and then we wipe out the writing with a soft cloth, such as a handkerchief. The writing cannot now be seen, but if we breathe upon the glass it will instantly become visible, and, to those not in the secret, will seem very mysterious and weird indeed.



## THE WHEELS THAT TURN

HERE is a picture of a motor-car going along a hilly country road. There are no police traps, and the motor is going at a great speed. We can see that it is moving



by the way the wheels are going round. We may not think at first that the motor is really going at all, but if we put this book down flat on the table and look steadily at the centre of either wheel, with our eyes about a foot from the book, and then, without raising the book from the table, give it a quick circular motion, the wheels will appear to be going round rapidly. In another place in our book you will find another example of how our eyes deceive us, in spite of the old saying that "seeing is believing."

CONTINUED ON PAGE 616.

# The Book of POETRY

## A PROPHECY OF THE FUTURE

**I**N this poem, written nearly fifty years ago, John Townsend Trowbridge gives a very amusing account of the first American flying-machine. In the days when he wrote it, the hero was ahead of his time in being of the opinion "that the air is also man's dominion," but there are many to-day reaping the results of early work like his. Darius scorned to let the swallow and blackbird and wren know more than he knew. He believed that wings were just as necessary to him in earning his living as they were to the bee, and so he set to work and made some—with what result you will see!

## DARIUS GREEN AND HIS FLYING-MACHINE

**I**F ever there lived a Yankee lad,  
Wise or otherwise, good or bad,  
Who, seeing the birds fly, didn't jump  
With flapping arms from stake or stump,  
Or, spreading the tail  
Of his coat for a sail,  
Take a soaring leap from post or rail,  
And wonder why  
He couldn't fly.

And flap and flutter and wish and try,—  
If ever you knew a country dunce  
Who didn't try that as often as once,  
All I can say is, that's a sign  
He never would do for a hero of mine.

An aspiring genius was D. Green  
The son of a farmer, —age fourteen;  
His body was long and lank and lean,  
Just right for flying, as will be seen;  
He had two eyes, each bright as a bean,  
And a freckled nose that grew between,  
A little awry, for I must mention  
That he had riveted his attention  
Upon his wonderful invention,  
Twisting his tongue as he twisted the strings,

Working his face as he worked the wings,  
And with every turn of gimlet and screw  
Turning and screwing his mouth round  
too,

Till his nose seemed bent  
To catch the scent,  
Around some corner, of new-baked pies,  
And his wrinkled cheeks and his squinting eyes

Grew puckered into a queer grimace,  
That made him look very droll in the face,  
And also very wise.

And wise he must have been, to do more  
Than ever a genius did before,  
Excepting Dædalus of yore  
And his son Icarus, who wore  
Upon their backs  
Those wings of wax  
He had read of in the old almanacs.

CONTINUED FROM 5987



Darius was clearly of  
the opinion,  
That the air is also man's  
dominion,

And that, with paddle or fin or  
pinion,

We soon or late  
Shall navigate

The azure as now we sail the sea  
The thing looks simple enough to  
me;

And if you doubt it,  
Hear how Darius reasoned about it.

"Birds can fly,  
An' why can't I?  
Must we give in,"  
Says he with a grin,  
"T' the bluebird an' phoebe  
Are smarter'n we be?"

Jest fold our hands an' see the swaller,  
An' blackbird an' catbird beat us holler?  
Dooos the leetle chatterin', sassy wren,  
No bigger'n my thumb, know more than  
men?

Jest show me that!  
Er prove 't the bat  
Hez got more brains than's in my hat,  
An' I'll back down, an' not till then!"

He argued further: "Ner I can't see  
What's th' use o' wings to a bumble-bee,  
Fer to git a livin' with, more'n to me;—  
Ain't my business  
Important 's his'n is?"

"That Icarus  
Was a silly cuss,—  
Him an' his daddy Dædalus,  
They might 'a' knowed wings made o' wax  
Wouldn't stan' sun-heat an' hard whacks.  
I'll make mine o' luther,  
Er suthin' er other."

And he said to himself, as he tinkered  
and planned:

"But I ain't goin' to show my hand  
To nummies that never can understand  
The fust idee that's big an' grand.  
They'd 'a' laft an' made fun  
O' Creation itself afore 'twas done!"



So he kept his secret from all the rest,  
Safely buttoned within his vest;  
And in the loft above the shed  
Himself he locks with thimble and thread  
And wax and hammer and buckles and  
screws  
And all such things as geniuses use;—  
Two bats for patterns, curious fellows!  
A charcoal-pot and a pair of bellows;  
An old hoop-skirt or two, as well as  
Some wire, and several old umbrellas;  
A carriage-cover, for tail and wings;  
A piece of harness; and straps and strings;  
And a big strong box,  
In which he locks  
These and a hundred other things.

His grinning brothers, Reuben and Burke  
And Nathan and Jotham and Solomon, lurk  
Around the corner to see him work,—  
Sitting cross-legged, like a Turk,  
Drawing the waxed end through with a jerk,  
And boring the holes with a comical quirk  
Of his wise old head, and knowing smirk.  
But vainly they mounted each other's backs,  
And poked through knot-holes and pried  
through cracks;  
With wood from the pile and straw from  
the stacks  
He plugged the knot-holes and calked the  
cracks;  
And a bucket of water, which one would  
think  
He had brought up into the loft to drink  
When he chanced to be dry,  
Stood always nigh,  
For Darius was sly!  
And whenever at work he happened to spy  
At chink or crevice a blinking eye,  
He let a dipper of water fly

"Take that! an' ef ever ye git a peep,  
Guess ye'll ketch a weasel asleep!"  
And he sings as he locks  
His big strong box:—

### SONG

"The weasel's head is small an' trim,  
An' he is leetle an' long an' slim,  
An' quick of motion an' nimble of limb,  
An' ef yeou'll be  
Advised by me,  
Keep wide awake when ye're ketchin' him!"

So day after day  
He stitched and tinkered and hammered  
away,  
Till at last 'twas done,—  
The greatest invention under the sun!  
"An' now," says Darius, "hooray fer some  
fun!"

'Twas the Fourth of July,  
And the weather was dry,  
And not a cloud was on all the sky,  
Save a few light fleeces, which here and  
there,  
Half mist, half air,  
Like foam on the ocean went floating by—  
Just as lovely a morning as ever was seen  
For a nice little trip in a flying-machine

Thought cunning Darius: "Now I sha'n't go  
Along 'ith the fellers to see the show  
I'll say I've got such a terrible cough!  
An' then, when the folks 'ave all gone off,  
I'll hev full swing  
Fer to try the thing  
An' practise a leetle on the wing."  
"Ain't goin' to see the celebration?"  
Says Brother Nate. "No; botheration!  
I've got sich a cold—a toothache—I—  
My gracious!—feel 's though I should fly!"

Said Jotham, "Sho!  
Guess ye better go."  
But Darius said, "No!  
Shouldn't wonder 'f yeou might see me though,  
'Long 'bout noon, ef I git red  
O' this jumpin', thumpin' pain 'n my head!"  
For all the while to himself he said:—

"I tell ye what!  
I'll fly a few times around the lot,  
To see how 't seems, then soon 's I've got  
The hang o' the thing, ez likely 's not,  
I'll astonish the nation  
An' all creation  
By flyin' over the celebration!  
Over their heads I'll sail like an eagle;  
I'll balance myself on my wings like a sea-  
gull;  
I'll dance on the chimbleys; I'll stan' on  
the steeple;  
I'll flop up to winders an' scare the people!  
I'll light on th' libbe'ty-pole, an' crow;  
An' I'll say to the gawpin' fools below,  
'What world's this 'ere  
That I've come near?'  
Fer I'll make 'em b'lieve I'm a chap f'm the  
moon!  
An' I'll try a race 'ith their ol' bulloon."  
He crept from his bed:  
And, seeing the others were gone, he said,  
"I'm a-gittin' over the cold 'n my head."  
And away he sped,  
To open the wonderful box in the shed.

His brothers had walked but a little way  
When Jotham to Nathan chanced to say,  
"What on airth is he up to, hey?"  
"Don'o',—th' 's suthin' er other to pay,  
Er he couldn't 'a' stayed to hum to-day."  
Says Burke, "His toothache's all in his eye!  
He never'd miss a Fo'th-o'-July,  
Ef he hedn't got some machine to try."

Then Sol, the little one, spoke: "By darn!  
Le's hurry back an' hide 'n the barn,  
An' pay him fer tellin' us that yarn!"  
"Agreed!" Through the orchard they creep  
back,  
Along by the fences, behind the stack,  
And one by one, through a hole in the wall,  
In under the dusty barn they crawl,  
Dressed in their Sunday garments all;  
And a very astonishing sight was that,  
When each in his cobwebbed coat and hat  
Came up through the floor like an ancient rat.  
And there they hid;  
And Reuben slid  
The fastenings back, and the door undid.  
"Keep dark!" said he,  
"While I squint an' see what the' is to see."

As knights of old put on their mail,—  
From head to foot  
An iron suit,  
Iron jacket and iron boot,  
Iron breeches, and on the head  
No hat, but an iron pot instead,  
And under the chin the bail,—  
I believe they called the thing a helm.  
And the lid they carried they called a shield;  
And, thus accoutred, they took the field,  
Sallying forth to overwhelm  
The dragons and pagans that plagued the realm:—

So this modern knight  
Prepared for flight,  
Put on his wings and strapped them tight,  
Jointed and jaunty, strong and light;  
Buckled them fast to shoulder and hip,—  
Ten feet they measured from tip to tip!  
Not on his head like those of yore,  
But more like the helm of a ship  
"Hush!" Reuben said,  
"He's up in the shed!"  
He's opened the winder,—I see his head!  
He stretches it out,  
An' pokes it about,  
Lookin' to see 'f the coast is clear,  
An' nobody near,—  
Guess he don't who's hid in here!  
He's riggin' a spring board over the sill!  
Stop laffin', Solomon! Burke, keep still!  
He's climbin' out now—Of all the things!  
What's he got on? I van, it's wings!  
An' t' other thing? I vim, it's a tail!  
An' there he sets like a hawk on a rail!  
Steppin' careful, he travels the length  
Of his spring-board, and tecters to try its strength.

Now he stretches his wings, like a monstrous bat;  
Pecks over his shoulder, this way an' that,  
Fer to see 'f the 's any one passin' by;  
But the 's on' a ca'f an' a goslin' nigh.  
They turn up at him a wonderin' eye,  
To see—The dragon! he's goin' to fly!  
Away he goes! Jimminy! what a jump!  
Flop flop—an' plump  
To the ground with a thump!  
Flutt'rin' an' flound'rin', all 'n a lump!"

As a demon is hurled by an angel's spear,  
Heels over head, to his proper sphere,—  
Heels over head, and head over heels,  
Dizzily down the abyss he wheels,—  
So fell Darius. Upon his crown,  
In the midst of the barnyard, he came down,  
In a wonderful whirl of tangled strings,  
Broken braces and broken springs,  
Broken tail and broken wings,  
Shooting-stars, and various things!  
Away with a bellow fled the calf,  
And what was that? Did the gosling laugh?  
'Tis a merry roar  
From the old barn-door,  
And he hears the voice of Iotham crying,  
"Say, D'rius! how de yeou like flyin'?"

Slowly, ruefully, where he lay,  
Darius just turned and looked that way,  
As he stanchd his sorrowful nose with his cuff.

"Wal, I like flyin' well enough,"  
He said, "but the' ain't sich a thunderin'  
sight  
O' fun in 't when ye come to light."

### MORAL

I just have room for the moral here:  
And this is the moral,—stick to your sphere.  
Or if you insist, as you have the right,  
On spreading your wings for a loftier flight,  
The moral is,—Take care how you light.

### FOUR DUCKS ON A POND

It may not be "four ducks on a pond," that we remember for years, but very likely we have some little picture of like simple beauty imprinted for ever on our memory. The writer, William Allingham, who died in 1889, possessed to a high degree the art of word painting as these simple lines show

FOUR ducks on a pond,  
A grass-bank beyond,  
A blue sky of spring,  
White clouds on the wing:  
What a little thing  
To remember for years—  
To remember with tears!

### GIVE US MEN

The following spirited appeal to the nation to furnish true men to further the interests of the country is supposed to have been written by a Bishop of Exeter

GIVE us men!  
Men from every rank,  
Fresh and free and frank:  
Men of thought and reading,  
Men of light and leading,  
Men of loyal breeding,  
The nation's welfare speeding.  
Men of faith and not of fiction,  
Men of lofty aim in action,  
Give us men—I say again  
Give us men!

Give us men!  
Strong and stalwart ones:  
Men whom highest hope inspires,  
Men whom purest honor fires,  
Men who trample self beneath them,  
Men who make their country wreath them  
As her noble sons,  
Worthy of their sires:  
Men who never shame their mothers,  
Men who never fail their brothers,  
True however false all others,  
Give us men—I say again,  
Give us men!

Give us men!  
Men who when the tempest gathers  
Grasp the standard of their fathers  
In the thickest fight:  
Men who strike for home and altar  
(Let the coward cringe and falter,)  
God defend the right!  
True as truth though low and lonely,  
Tender as the brave are only:  
Men who tread where saints have trod,  
Men for country, home and God;  
Give us men—I say again,  
Give us such men!

### THE DOUGLAS TRAGEDY

This is an old ballad dating from very early times. It is known in Denmark and in other European countries, and the Scotch have localized it as happening in Black House on Douglas Burn.

**R**ISE up, rise up, now, Lord Douglas,"  
she says,

"And put on your armor so bright;  
Let it never be said, that a daughter of thine  
Was married to a lord under night.

"Rise up, rise up, my seven bold sons,  
And put on your armor so bright,  
And take better care of your youngest sister,  
For your eldest's awa the last night."

He's mounted her on a milk-white steed,  
And himself on a dapple gray,  
With a bugelet horn hung down by his side,  
And lightly they rode away.

Lord William lookit o'er his left shoulder,  
To see what he could see,  
And there he spy'd her seven brethren bold,  
Come riding over the lea.

"Light down, light down, Lady Marg'ret,"  
he said,

"And hold my steed in your hand,  
Until that against your seven brothers bold,  
And your father, I mak' a stand."

She held his steed in her milk-white hand,  
And never shed one tear,  
Until that she saw her seven brethren fa',  
And her father hard fighting, who loved  
her so dear.

"O hold your hand, Lord William!" she  
said,

"For your strokes they are wond'rous sair,  
True lovers I can get many a one,  
But a father I can never get man."

O she ta'en out her handkerchief,  
It was o' the holland sae fine,  
And aye she dight her father's bloody  
wounds,  
That were redder than the wine.

"O chuse, O chuse, Lady Marg'ret," he said,  
"O whether will ye gang or bide?"

"I'll gang, I'll gang, Lord William," she said,  
"For ye have left me no other guide."

He's lifted her on a milk-white steed,  
And himself on a dapple gray,  
With a bugelet horn hung down by his side,  
And slowly they baith rode away.

O they rode on, and on they rode,  
And a' by the light of the moon,  
Until they came to yonn wan water,  
And there they lighted down.

They lighted down to tak a drink  
Of the spring that ran sae clear;  
And down the stream ran his gude heart's  
blood,  
And sair she gan to fear.

"Hold up, hold up, Lord William," she says,  
"For I fear that you are slain!"

"Tis naething but the shadow of my scarlet  
cloak,  
That shines in the water sae plain."

O they rode on, and on they rode,  
And a' by the light of the moon,  
Until they cam' to his mother's ha' door,  
And there they lighted down.

"Get up, get up, lady mother," he says,  
"Get up, and let me in!"  
Get up, get up, lady mother," he says,  
"For this night my fair ladye I've win."

"O mak my bed, lady mother," he says,  
"O mak it braid and deep!"  
And lay Lady Marg'ret close at my back,  
And the sounder I will sleep."

Lord William was dead lang ere midnight,  
Lady Marg'ret lang ere day—  
And all true lovers that go thegither,  
May they have mair luck than they!

Lord William was buried in St Mary's kirk,  
Lady Margaret in Mary's quire;  
Out o' the lady's grave grew a bonny red  
rose,  
And out o' the knight's a brier.

And they twa met, and they twa plat',  
And fain they wad be near;  
And a' the world might ken right weel,  
They were twa lovers dear.

And' bye and rode the Black Douglas,  
And wow but he was rough!  
For he pull'd up the bonny brier,  
And flang' i' in St Mary's loch.

### LA BELLE DAME SANS MERCI

Some of us perhaps have seen Rossetti's picture of Keats' "Belle Dame" accompanied by the young knight whom, by her fatal charms, she has lured from honor and duty, and left to a tragic, sad fate.

**A**H, what can ail thee, wretched wight,  
Alone and palely loitering  
The sedge is wither'd from the lake,  
And no birds sing.

Ah, what can ail thee, wretched wight,  
So haggard and so woe-begone?  
The squirrel's granary is full,  
And the harvest's done.

I see a lily on thy brow,  
With anguish moist and fever dew;  
And on thy cheek a fading rose  
Fast withereth too.

I met a lady in the meads,  
Full beautiful, a faery's child;  
Her hair was long, her foot was light,  
And her eyes were wild.

I set her on my pacing steed,  
And nothing else saw all day long;  
For sideways would she lean and sing  
A faery's song.

I made a garland for her head,  
And bracelets too, and fragrant zone;  
She look'd at me as she did love,  
And made sweet moan.

She found me roots of relish sweet,  
And honey wild, and manna dew,  
And sure in language strange she said,  
I love thee true.

She took me to her elfin grot,  
And there she gaz'd and sighed deep;  
And there I shut her wild sad eyes—  
So kissed to sleep.

And there we slumber'd on the moss,  
And there I dream'd, ah woe betide,  
And latest dream I ever dream'd,  
On the cold hill side.

I saw pale kings, and princes too,  
Pale warriors, death-pale were they all;  
Who cry'd—"La Belle Dame sans merci  
Hath thee in thrall!"

I saw their starv'd lips in the gloom,  
With horrid warning gap'd wide,  
And I awoke, and found me here  
On the cold hill side.

And this is why I sojourn here  
Alone and palely loitering,  
Though the sedge is wither'd from the lake  
And no birds sing.

### ODE TO THE WEST WIND

This is a very fine example of a lyric—that is, a poem which expresses the poet's own thoughts and feelings with spontaneity and unreserve. Shelley particularly excelled in this kind of work. His sensitive spirit was depressed by some cause or other, and he appeals to the west wind, who will upheave a dead leaf, a swift cloud or a wave, to lift him, too, above the thrush of life and scatter his thoughts abroad like the sound of a great trumpet blowing.

O WILD West Wind, thou breath of  
Autumn's being,  
Thou, from whose unseen presence the leaves  
dead  
Are driven, like ghosts from an enchanter  
fleeing,

Yellow, and black, and pale, and hectic red,  
Pestilence-stricken multitudes: O thou,  
Who chariotest to their dark wintry bed

The winged seeds, where they lie cold and  
low,

Each like a corpse within its grave, until  
Thine azure sister of the Spring shall blow  
Her clarion o'er the dreaming earth, and fill  
(Driving sweet buds like flocks to feed in air)  
With living hues and odors plain and hill

Wild Spirit, which art moving everywhere;  
Destroyer and preserver; hear, oh, hear!

Thou on whose stream, 'mid the steep sky's  
commotion,  
Loose clouds like earth's decaying leaves are  
shed,  
Shook from the tangled boughs of Heaven  
and Ocean.

Angels of rain and lightning: there are  
spread

On the blue surface of thine airy surge,  
Like the bright hair uplifted from the head  
Of some fierce Maenad, even from the dim  
verge

Of the horizon to the zenith's height,  
The locks of the approaching storm. Thou  
dirge

Of the dying year, to which this closing night  
Will be the dome of a vast sepulchre,  
Vaulted with all thy congregated might

Of vapors, from whose solid atmosphere  
Black rain, and fire, and hail will burst. oh,  
hear!

Thou who didst waken from his summer  
dreams  
The blue Mediterranean, where he lay,  
Lulled by the coil of his crystalline streams,

Beside a pumica isle in Baiae's bay,  
And saw in sleep old palaces and towers  
Quivering within the wave's intenser day,

All overgrown with azure moss, and flowers  
So sweet the sense faints picturing them!  
Thou

For whose path the Atlantic's level powers

Cleave themselves into chasms, while far  
below

The sea-blooms and the oozy woods which  
were

The sapless foliage of the ocean know

Thy voice, and suddenly grow gray with fear,  
And tremble and despoil themselves; oh,  
hear!

If I were a dead leaf thou mightest hear;  
If I were a swift cloud to fly with thee;  
A wave to pant beneath thy power, and  
share

The impulse of thy strength, only less free  
Than thou, O uncontrollable! If even  
I were as in my boyhood, and could be

The comrade of thy wanderings over heaven,  
As then, when to outstrip thy skyeey speed  
Scarce seem'd a vision; I would ne'er have  
striven

As thus with thee in prayer in my sore need.  
Oh, lift me as a wave, a leaf, a cloud!  
I fall upon the thorns of life! I bleed!

A heavy weight of hours has chained and  
bowed  
One too like thee: tameless, and swift, and  
proud

Make me thy lyre, even as the forest is:  
What if my leaves are falling like its own!  
The tumult of thy mighty harmonies

Will take from both a deep, autumnal tone,  
Sweet though in sadness. Be thou, Spirit  
fierce,  
My spirit! Be thou me, impetuous one!

Drive my dead thoughts over the universe  
Like withered leaves to quicken a new birth!  
And, by the incantation of this verse,

Scatter, as from an unextinguished hearth  
Ashes and sparks, my words among man-  
kind!

Be through my lips to unawakened earth

The trumpet of a prophecy! O wind,  
If Winter comes, can Spring be far behind?

## AMERICA'S MOST VALUABLE PLANT



The maize, or Indian corn, or simply corn, is the most valuable crop raised in America. The earliest settlers found the Indians growing small fields of this crop, which they prepared in several different ways. White men soon learned to raise it, and now the United States produces about 3,000,000,000 bushels a year, or three to four times as much as the wheat crop. It makes good food for mankind and for animals, and its stalks are often eaten by animals. The stalks have been cut off close to the ground, and put into shocks. Later they will be taken to the barns. The ears are sometimes taken off before the stalks are cut. When the English use the word corn, they mean wheat, as they do not use much maize.

WHAT THIS STORY TELLS US

SO much is said of the great wheat belt of the prairies, of the Western provinces, and of the fertile farm lands of the other provinces, that we usually look upon Canada as being chiefly an agricultural country, and give small attention to her mineral resources. It is true that up until recently not much effort was made to develop her mines. Her wealth has lain chiefly in her farm lands and forests and indeed her fertile lands lay upon her the responsibility of continuing to be one of the great granaries of the world. Nevertheless, her mountains contain great stores of minerals, and the time is not far distant when a large industrial population will grow up within her borders, whose occupation will be provided for them by the products of her mines. This story gives us a short account of the mineral resources of the Dominion, and from it we can learn to judge for ourselves where manufacturing cities are likely to grow up.

THE MINERAL RESOURCES OF CANADA

IN other places in the Book of Canada, you may read of her scenery, her great fisheries, the broad acres of her farm lands, the romance of the wheat fields of her prairies, and her miles of forest lands. Now we are going to think for a few minutes of the treasures of metals, and other minerals, that are hidden in her mountains, and rocks, or stored deep down under the surface of the earth.

Canada has been very slow in developing her mineral resources. Fur trapping and woodcraft appealed more than prospecting for minerals to the adventurous spirits among the Frenchmen who made the first settlements in the country. The English-speaking settlers, from the Loyalists onward, who came after them, were all home seekers, and it was not until quite recently that any effort was made to dig wealth out of the earth. Indeed, although the Dominion owns nearly half the continent of North America, until very lately it was doubted whether Canada would ever become an important mining country. On account of the activity of the last few years, however, Canadians now hope that their country will become as rich in mines and metal industries

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as the great republic to the south.

Almost all the provinces possess mineral resources of importance, but only four—Nova Scotia, British Columbia, Alberta and Ontario—have up to this time been large producers of the products of mines.

IRON, THE MOST VALUABLE OF  
ALL THE METALS

Probably if a class of fifty school children were asked, "What are the most valuable metals known?" forty-five of them would answer in chorus, "gold and silver." Are they? Of what use would a gold plough or a silver harrow be? How long do you think a silver steam engine would last, or a steamboat made of gold? The Aztecs of Mexico and the Incas of Peru had great stores of gold and silver; but they went down before a mere handful of Spanish soldiers, who were armed with steel weapons. Gold and silver are valuable for many things besides money and jewelry, but iron is much more valuable to the welfare of the world than either, and the country that has stores of iron is fortunate.

Prince Edward Island is the only one of the Canadian provinces which has no iron. Moreover, coal to pro-

vide heat to smelt the iron is found in vast quantities. Tungsten, which is used to harden steel for tools, is found, though not in large quantities, and the mineral called by the curious name of molybdenum, which is useful for the same purpose, is found in many places. This mineral has not been mined, but when they need it, men know that it is there.

It is true, also, that there are no iron mines in operation outside of Nova Scotia, Quebec and Ontario. The world has not needed the iron, and there has been no call for it, but when the land fills up with people, the iron is there in reserve for their use. The only important iron mines which are being worked are in Nova Scotia, where the iron lies close beside the coal beds, and coal can be delivered to the coke-making plants for little more than the cost of mining it.

Huge quarries of limestone in Nova Scotia produce the tons and tons of this stone that are used in the smelting mills. Of course this stone is found in very many other places in the Dominion. For instance, as we have read in another place, the Rocky Mountains are partly made of it. Limestone, as we know, is used in other ways, such as for building material and to make mortar, but it is interesting to speak of it here, because we do not often think of it in association with iron.

### CANADA'S GREAT WEALTH IN COAL

We do not include coal among the metals; but as we have already spoken of it in connection with iron, we shall tell about it here. Ontario has only a very small deposit of coal, and Quebec has none. The deposits in Manitoba and New Brunswick are not very important, but there are vast supplies in other places. We may read elsewhere of the important mines in Nova Scotia and British Columbia, where the chief coal mining industries are carried on. Saskatchewan has large deposits; it is believed that Alberta possesses over a trillion tons, which have scarcely been touched, while in the Yukon and the Northwest Territories it is estimated that there are billions of tons.

### THE NICKEL MINES AND COPPER MINES OF THE DOMINION

We talk so much nowadays of nickel steel, the hard alloy of steel and nickel which is used for armor plate, bridge

building and other purposes, that it is natural to think of iron and nickel at the same time. Large quantities of nickel are used in making this steel every year, and the metal is used in many other ways. Iron and steel are nickel-plated to prevent rust; nickel is used in making the alloy called German silver; it is used in making United States five cent coins and so on. It is interesting, therefore, to learn that three-quarters of all the nickel used in the world comes from the Sudbury district in Western Ontario, and that in spite of the large output of the mines, they show no sign of exhaustion. Nickel is also found in the northern part of Ontario, in what is known as the Cobalt district, but of this famous mining district, we shall speak presently.

The Sudbury district also produces large quantities of copper, for which you can think of so many uses, that we need suggest none. British Columbia, however, goes far beyond Ontario in the value of her copper mines. Copper is found in Quebec and Nova Scotia, and large deposits have lately been found by explorers on the frozen Arctic shores and in some of the Arctic islands.

### GOLD AND SILVER ARE FOUND IN LARGE QUANTITIES

Many stories have been told of the rush to British Columbia when gold was first found, and later to the Yukon district. Hundreds of men lost their lives, many more lost their all; a few made huge fortunes from their claims. Nowadays the gold mining industry stands on a more business-like basis than in the early picturesque days. Large mining companies are formed, much machinery is used, and a great deal of gold is produced from gold-bearing quartz rocks, which the early miners could not reach, and great quantities of gold are every year shipped out of the country.

British Columbia has long been known as a gold mining country. It is the northwest continuation of the great gold and silver bearing belt of the Western states, from which so many hundreds of millions of dollars' worth of the precious metals have been obtained. Gold is found in paying quantities in almost every section of the province, and there is scarcely a creek where "color" cannot be found. The yearly output reaches millions of dollars.

## PROSPECTORS FOR GOLD IN CANADA



The search for gold will lead men to go almost anywhere and risk almost any hardship. Here are a lot of prospectors, gathered around what we are told was the leading restaurant in the vicinity. This picture was taken near a gold-strike which had just been made. These men come from every class of society.



This track is wide enough for a horse, but not for a vehicle. All goods must be packed on horseback or carried by men themselves if they cannot afford to buy horses. It is a difficult and expensive means of carrying freight, as the weight a horse can carry over the steep hills is limited.

Pictures from Brown Bros.



The history of gold mining in Ontario is not so picturesque as the story of the early gold days in British Columbia and the Yukon. Nevertheless Ontario has very valuable deposits of gold, and actually produces more of the precious metal than British Columbia. Nova Scotia also produces gold, and so do Manitoba and Saskatchewan, though in much smaller quantities.

If the gold mining story of Ontario is not picturesque, this cannot be said of the history of silver mining. In 1903 Ontario scarcely knew that she possessed silver; but in that year a wonderful deposit of silver ore, mixed with nickel, bismuth, cobalt, copper, lead and zinc, was discovered. Instantly there was a rush for the district; mining companies were formed, people mortgaged their property to buy shares, and there was much excitement. Generally the mines have been well managed, and the original shareholders have made a good deal of money, for the mines proved to be very rich. These Cobalt mines, and the mines at Kootenay in British Columbia, which have been famous for a number of years, have put Canada third among the silver producing countries of the world.

Platinum, which is counted among the precious metals, is found in Canada, in paying quantities, but the deposits are not large.

#### **LEAD, ZINC AND THE MINOR METALS**

Lead is nearly always found with silver, and the Canadian silver mines are no exception to the rule. Lead is mined as an ore of silver, in which it may be looked upon as a by-product. The output is large, and will continue to increase with that of silver. The same thing may be said of zinc, which is found and mined in British Columbia and Ontario.

The world's supply of cobalt, from which we get the wonderful cobalt blue, comes from the silver mines at Cobalt, and these mines also produce arsenic. Corundum, a hard mineral used in making grinding stones, is found in Ontario. Manganese and antimony exist in the Maritime Provinces, and some cinnabar, or sulphide of mercury, is mined in British Columbia.

#### **PETROLEUM, OR ROCK OIL, AND NATURAL GAS**

Petroleum you may think does not come under the head of mineral re-

sources; but you know the word means "rock oil," and this thick, oily substance was made by the same forces of nature that produced coal. It is found in many parts of Ontario, and especially in the peninsula which stretches out between Lake Erie and Lake Huron. Petroleum has also been found in Gaspé, Quebec, in New Brunswick, and in British Columbia, and it is believed that a large area of oil bearing strata underlies Northern Alberta.

Wherever we find oil, we are not surprised to find natural gas; and this is true of Canada as of other places. Gas has been found along Lake Erie, in Ontario, in New Brunswick, in Alberta and in British Columbia, and is important for fuel, lighting and manufacturing.

#### **MATERIALS USED IN BUILDING**

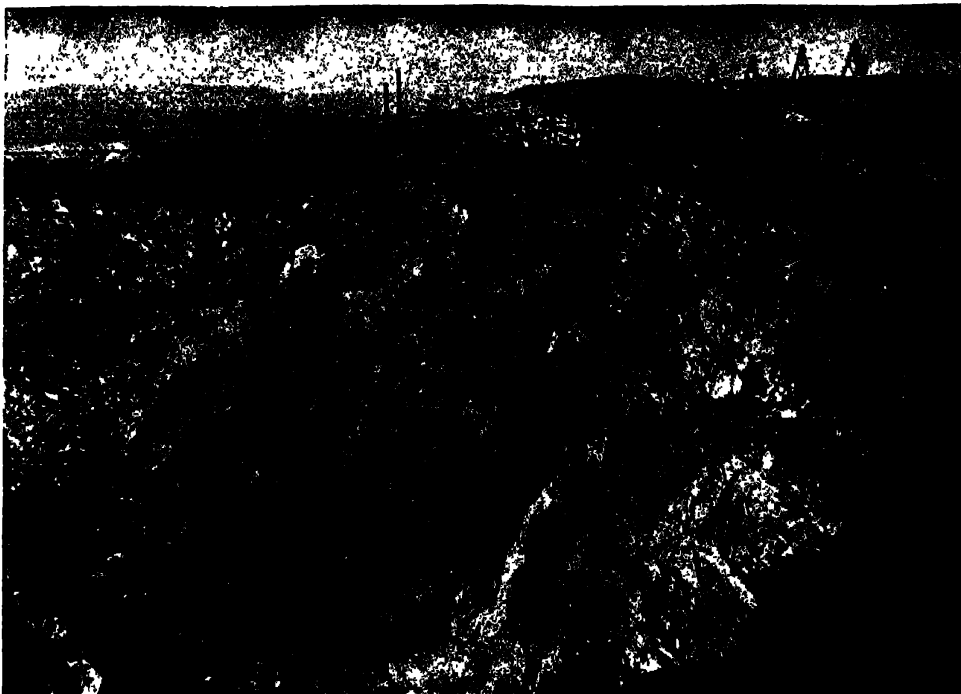
In another place, we have told you about the white gypsum cliffs of Nova Scotia, and there you may also read of the gypsum quarries in New Brunswick. Gypsum is also found in Ontario, but none of the other deposits come up to these of Nova Scotia in richness. Very important deposits of asbestos are found throughout Ontario and Quebec, and give the world the largest part of its supply of asbestos, or mineral wool, as it is sometimes called from its woolly, fibre-like appearance. As you know, asbestos is almost absolutely fireproof, and its use for packing, for theatre curtains, and the like has prevented many fires.

We might go on and tell you about the Dominion's supply of graphite and salt; of its granite quarries and slate quarries; of the clay from which bricks, tiles and cement are made; but if we did you might think of this story as being only an uninteresting geological catalogue.

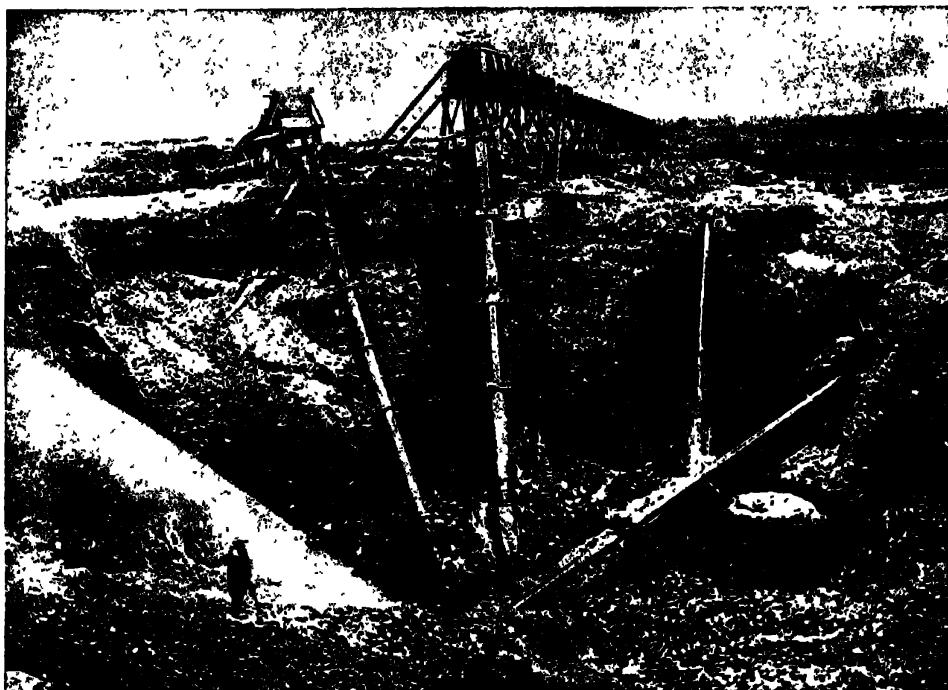
We have said enough to show you the great mineral treasures our country has so that you may see that she comes behind no other nation in the wealth of all her natural resources, and perhaps enough to rouse your curiosity and make you want to learn more about it. The study of geology will show you why we expect to find copper and gold together; or silver and lead; how a geologist knows where a miner is likely to find coal in the Rockies, or petroleum in the Alberta coal fields, and many other fascinating things which we cannot touch on here.

THE NEXT STORY OF CANADA IS ON PAGE 6119.

## MINING FOR ASBESTOS AND FOR GOLD



This is a picture of an asbestos quarry at Thetford, in Quebec. Asbestos is a curious mineral in which the rock crystals form fibres. The long fibres are spun and woven into fireproof cloth, which is used for theatre curtains, steam pipe coverings, and such purposes. The short fibres are made into felt and thick board. Paint is also made from the mineral. Most asbestos used in the world comes from Canada.



Hydraulic mining, that is, mining by water pressure, is now followed in many places where gold is found free in gravel beds. Strong streams of water, which are directed against the banks, break them down and carry the gravel into sluices. The heavy gold sinks, while the lighter stones and earth are washed away. Photographs from Brown Bros., New York.

## LOOKING INTO THE VAST OCEAN OF SAND



This picture of an Arab traveler gazing into the distance gives us some conception of the awful loneliness and desolation of the Desert, with its vast ocean of sand stretching far out beyond the horizon.



## THE PEOPLES OF THE DESERT THE WILD, FREE RACES OF THE EARTH AT HOME

A BURNING expanse of red, grey, brown, or white sand, thinly dotted with oases of wells and grass, and diversified with stony and rocky tracts—that is the scene which springs up in imagination at the very mention of deserts. The mind at once flies to Arabia, the typical land of wilderness desolation, or to the vast African Sahara, for these two marvelous regions have always been, above all others, representative of the desert.

But the world's great deserts are vaster and more varied than most of us realize. There are many great uninhabited wastes in the world, caused chiefly by the lack of rain. This accounts for the existence of the great Sahara, in North Africa, which starts at Cape Nun and stretches to the banks of the Nile, and then on the east of that river forms the Libyan Desert.

The most extensive of all the Asiatic wildernesses is the Mongolian Desert of Gobi. Arizona, one of the largest states of our own country, contains one of the biggest deserts of the New World. Other regions are arid and barren, bearing nothing but sage-bush and cactus. One of the

CONTINUED FROM 6049



most dreaded of the deserts is that in the interior of Australia.

The Arabian and African wilderness regions must ever exercise the most fascinating influence on the minds of civilized peoples. Consider the ways, for example, of the various tribes of the Arab race. The Arabs are mainly divided into two sections—those who inhabit towns, some on the borders of the desert, others within the wastes; and those who restlessly wander here and there. Now, the nomad Bedouin is very interesting. He has a hard life, but it is a very healthful one, and in some respects it is a happy existence, with its absolute freedom from town restraints, and its enjoyment of the pure sweet desert air.

Two of the largest and wealthiest of the Arab tribes are the famous Anaeze and the Shommar. Both are dreaded by travelers, and among them are many persistent robbers. These tribes and several others are constantly warring, one against the other, and the settled existence to which we are accustomed in civilized countries is unknown to them. All except one particular tribe possess

splendid horses. Carrying very long spears, often measuring twelve feet, pointed with steel lances, the Bedouin horse-men riding on these lovely steeds present a fine spectacle, especially when they indulge in the picturesque games in which they delight. They are fond of galloping and racing, and they like also the exercises in which they play at war.

Arab steeds are so well trained as rarely to need an iron bit. The ordinary Arab bridle is almost the same as our halter-strap. The desert horse seems to understand its master, and almost to interpret his will by a movement or touch. Most of the horses belong to the sheikhs, or head men of the tribes, and, except when they are needed, are kept at some distance from the camp.

#### THE WEALTH OF THE WANDERING ARABS

The Arab term Bedouin means dweller, and the traveler must wonder how these Bedouin tribes can exist at all in a vast sandy or rocky waste. Of course, there are great sandy areas, but a large part of the Arabian wilderness is a desert simply in the sense that it has no settled population.

If all were absolutely barren, these nomad Arabs could not live and prosper, and grow wealthy as some of the sheikhs do. The fact is that very large tracts of the soil are excellent. In springtime, after a heavy rainfall, Northern Arabia becomes like an American prairie over large areas. Lovely wild flowers spring up that would delight the heart of a botanist. This explains why the wandering Bedouin are rich in the possession of thousands of cattle, of camels, of horses, of sheep, of goats.

Dr. Zwemer, who lived at Bahrein, in the Pearl Islands, and who has traveled much as a devoted missionary among the desert tribes, says: "I am sure you can still find some of these Bedouin chiefs who, like Job, have seven thousand sheep, and three thousand camels, and a great household."

Just as in the time of Job, thousands of years ago, so do these children of the desert to-day dwell in black tents, made of goat's hair, which forms a perfect waterproof covering. These tents are square or oblong in shape.

#### THE STRANGE SPECTACLE OF A DESERT CAMP

An Arab desert camp is a singular

spectacle, but it is well worth visiting. For the journey into the desert from some outlying spot presents and a guide must be taken. The guide walks barefooted, for he prefers to carry his sandals tucked in his girdle.

Presently we come to flocks of sheep with their shepherds, who direct the guide to the camp, which never remains more than a month in one spot. It is sure to be pitched in some hollow, the deepest that can be found, for two reasons—the necessity of concealment from hostile bands of fellow-Arabs; and the advantage of shelter from the hot winds that blow over the desert plains.

#### THE DELIGHTFUL COURTESY OF THE ARAB TRIBES

The great encampment is carefully arranged. Some tribes spread their tents in a great square in rows; others prefer a picturesque oval. One feature never is lacking—the symbol of the authority of the sheikh. This little king always plants his spear in front of his tent. Just behind it is the section curtained off for the reception of guests. And how effusive, and even pathetic, is the hospitality of these Arabs, robbers and assassins though some of them are! Their kind courtesy to friendly visitors never fails, even though in the desert they would rob the very same folks without the slightest compunction, and perhaps slay them if resistance were offered. But never is a Bedouin of the wilderness known to violate the beautiful law of hospitality. Out of the burning sunshine the weary traveler is welcomed. The women hasten to bring him water to cool his head. A great bowl of camel's milk is offered before any questions are asked. At night a fat kid or lamb will be killed, and a feast provided.

#### THE MAGIC JUG IN THE DESERT

There are real luxuries in the Arab tents. The tents are spacious, for they will accommodate considerable quantities of several sorts of grain, chaff, fruits, dried fish, and wood. There is also ample room for refuge for fowls, goats, some cows, and a horse or two. The great main room has in the centre a large hollow which serves as the fireplace. The smoke must find its way out as best it can, so in time the tent becomes blacker and blacker; indeed, the old

## THE HOMES OF THE PEOPLE OF THE DESERT



A Bisharin tent in the Sahara Desert.



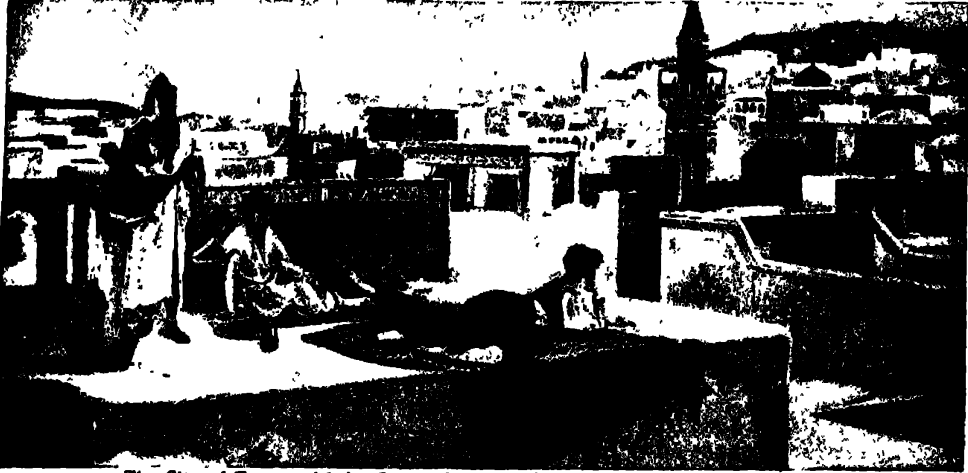
An Indian hut in the Arizona Desert.

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A group of Bisharin tribesmen in the great Sahara Desert.

## THE CITIES AND TOWNS OF THE DESERT



The City of Tunis, with its flat roofs, which largely take the place of gardens.



A miserable village in the Mongolian Desert of Gobi, with a fine Buddhist temple close by.



The picturesque market place at Assiout, on the Nile, with the mosque in the centre.

## SCENES & PERILS OF THE DESERT TRAVELER



The mirage—an imaginary oasis suddenly appearing to a group of travelers.



A caravan crossing the Sahara, with "tents" on the camels for the women travelers.



A sandstorm in the great Australian desert. Camels have been introduced into Australia, for use in the desert.



Bible phrase which speaks of the black tents of Kedar is as applicable now as then.

One great blessing is the famous porous jug. The Arabs who live and work in towns make unglazed water-jugs and jars. These are an unspeakable benediction to the people, for they have no ice. The wells are never very deep, and the water comes from a long distance. Thus, were it not for the water-jugs of this kind, cold water would be unknown. How, then, is it cooled? Very simply. If poured into one of these porous earthen pots and hung for a few minutes in the wind, the effect is astonishing, for the beverage becomes deliciously cold and refreshing.

### WHAT THE PEOPLE EAT AND DRINK

Palatable and wholesome is the desert fare. There are luxuries also in the food, though we should hardly relish the favorite dishes of the tribes, such as leben, the peculiar sour milk of mares and camels, which in Turkey is called yoghurt; pilaf, which is rice beautifully cooked and containing little shreds of lamb, or kid, or chicken. But when the Arabs make a great feast in the desert, they roast a sheep or goat whole on red-hot stones. Hard biscuits in the shape of rings, called kak, are much relished, and so is the peculiar butter called ghee. When the Arabs have to carry water about, they do so in great leathern bottles made of the whole skins of sheep and goats.

One beverage that is enjoyed in the desert cannot be excelled anywhere in the world. Coffee was first brought to Arabia from Abyssinia about the year 1400 by a pilgrim, whose tomb in Yemen is an object of veneration; and the seeds planted in Yemen produce the Mocha coffee which is so famous.

### DATES AND SUGAR-CANE

The chief of all foods among the desert peoples is the date, and the most precious thing that grows in the countries inhabited by these tribes is the date-palm, one of the noblest and most graceful of all trees. The Arabs of the desert eat much wild honey, and will feed abundantly on locusts when they can; they also feast eagerly on the big lizards that dart about among stony places, and do not disdain even the jerboa. But

the great article of diet is the date, without which the Arab of the wilds could hardly subsist. A joyous time is the festival known in the springtime as the Marriage of the Date Palms, when the soft spring breezes waft the pollen from the male to the female blossoms.

Arab children are never happier than when they are sucking sugar-cane, which is cut into pieces and sold by the knot—that is to say, by the length of the stick from one knot to the next. But nothing is so abundant as dates. Sometimes for many weeks nothing else will be eaten in an Arab tent, and even the donkeys and camels are fed on this fruit. Outside many a tent at this moment will be Arab boys and girls playing games with date-stones on the smooth sands. None of the date-stones are thrown away, for they are ground up into a coarse kind of meal for cattle food. Indeed, nothing is wasted that belongs to the date-palm. The fragrant blossoms make a favorite beverage, and if the fruit that has not been consumed turns stale and somewhat musty, it is converted into vinegar. The leaves are woven into string, fans, mats, and baskets, and the long, thin, strong branches are made up by the carpenters in the towns into chairs, cradles, cages, beds, boats, and countless other things.

### THE BREAKING UP OF A CAMP

One event in the desert is always exciting. This is the breaking up of a camp for a migration. When a tribe shifts its quarters, all possible preparations are made on the previous day, and, early in the morning, everything is in motion for the great departure.

Tents are taken down and packed, and soon the country is full of camels and flocks and herds and Arabs. Sometimes ten or a dozen camels will be arranged in procession at considerable intervals from each other. To the back of each camel are fastened four upright poles, which support a canopy called a *merkub*. On this erection rides an Arab girl, prostrate on her breast. These girls are always the sisters of heroes—men who have won fame in battle.

### THE SOLEMN MAJESTY OF A SEA OF SAND

The Bedouin Arabs are ignorant in one sense, for they have no schools and few can read and write. They are

## AN ARAB SCHOOL AND AN ARAB WORKSHOP



A Mohammedan school in Egypt, where the boys wear their hats and take off their shoes.



This is a photograph of some Arabs at work. Using both their fingers and their toes, they carve wood with amazing rapidity into beautiful shapes, making screens, boxes, and cabinets, which go all over the world.

## A HOUSE ON A CAMEL'S BACK



How a family crosses the Sahara Desert, living and sleeping in a tent.

Copyright by Underwood & Underwood



A pathetic scene in the desert: a camel sinking in the sand of the terrible Desert of Gobi.

## THE PEOPLES OF THE DESERT

temperate, for as Moslems they never taste intoxicants. There are no mosques in the deserts, of course, but these children of the wilderness are much given to prayer. The first chapter of the Koran is recited in every tent five times a day, while the worshippers prostrate themselves toward Mecca.

### THE VISION OF THE DESERT SKY

Caravans—what scenes this word conjures up! The longest and most perilous caravan expeditions are those which cross the great Sahara, and this vast African desert has its charms, its unspeakable fascinations, its indescribable phenomena. One of these is the mirage, the reflection in the sky which has puzzled so many travelers in ages past.

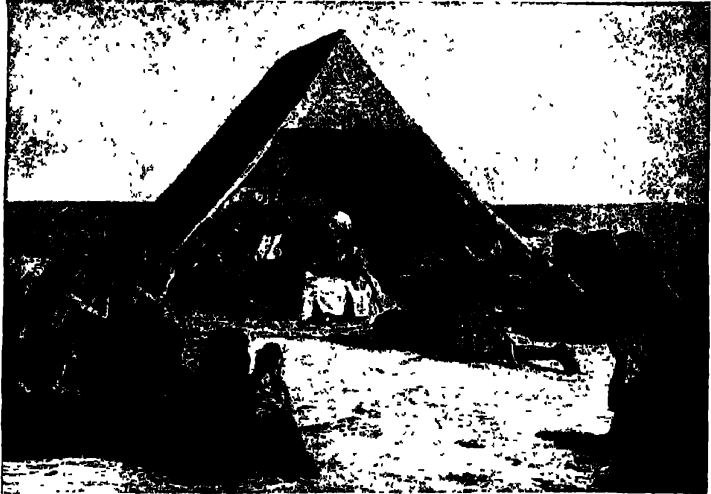
A traveler riding in the Syrian desert from Bagdad to Babylon was perplexed by seeing what looked like the great ruin Akarkuf, though he knew that it was more than thirty miles distant across the desert. Really what he saw was an old well, only a few hundred yards from where he stood wondering. Distressing have been the experiences of the members of great camel caravans crossing the Sahara, parched with thirst, under burning skies, suddenly plunged into ecstasy by the full view of palm-trees forming a lovely oasis at a little distance—for palm-trees always mean a delicious well close by. The travelers have in some sad instances rushed on to find that they had been mocked by a mirage, and men and beasts have perished.

The towns that border the deserts often lie in the centre of surrounding barren solitudes, as does Damascus, the oldest city on earth, where are lovely gardens, watered by fountains from Abana and Pharpar, the twin rivers that rush down from the snows of Lebanon.

Spots of enchantment in the Libyan Desert of Africa are the lovely oases, great patches of vegetation caused by the presence of water-springs. Four

very large and beautiful oases are inhabited by the great and famous tribe of Mugrebi Arabs, who love their gardens and villages embowered in date-palm groves, with sparkling fountains ever refreshing them. One of the most dreaded perils of the desert is that hot wind called by the Arabs the simoon. When this fierce and burning blast sweeps across the vast wastes it is deadly in its effect. Everyone in a caravan must, in order to escape alive, kneel in the sand with the mouth close to the ground, and, if possible, in the shelter of a camel, a roll of bedding or even a saddle.

The town-dwellers are gifted and clever. They excel in some crafts, especially in various sorts of woodwork.



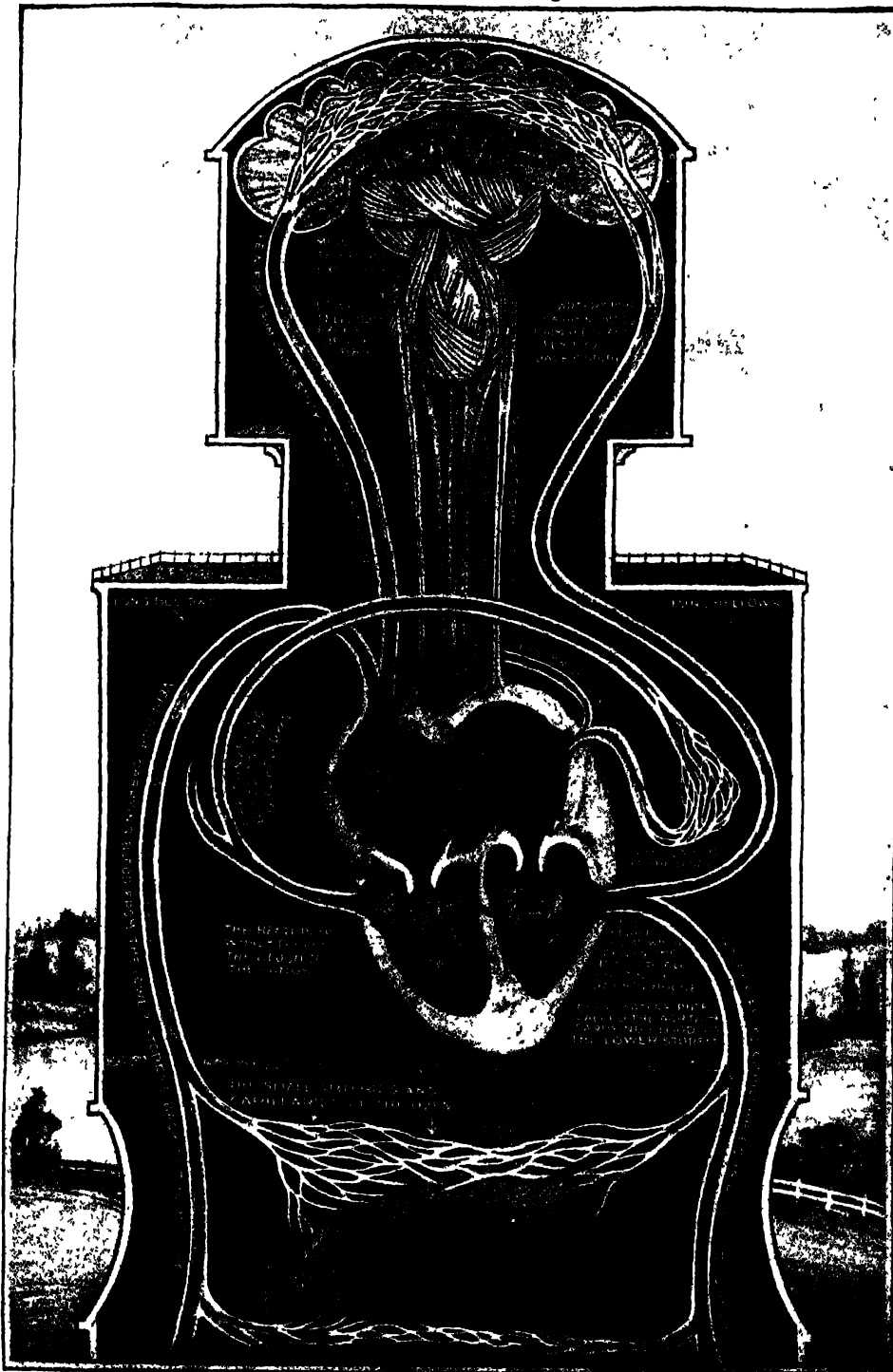
AN ARAB COURT OF JUSTICE IN THE DESERT

That delicate and ornate latticework which is seen in windows, doors, boxes, and cabinets is highly prized. Glass for windows is rarely used in Arabia excepting by Europeans, or by a few Arab families who have learned some of the Western ways. But in Arab houses are to be seen some of the loveliest windows that can be imagined.

The Arabs call a window *shibaak*, which means a network. The joiner fashions a most delicate fabric out of date-palm wood or bamboo, making little round bars, and fitting these to each other in a great variety of decorative designs. Through this fine latticework light and air come into the room, but none can look through upon the inmates from the outside world.

CONTINUED ON PAGE 6178

## THE GREAT PUMP OF JACK'S HOUSE



This shows the pump, called the heart, in the middle of Jack's house, and we can see how veins and corridors are linked with the top story. The heart pumps blood through Jack's body; if we start at the x in the heart, and follow the arrows, we can trace the course of a drop of blood through the body back to the heart. Capillaries of only one lung are shown. Really the capillaries spread through every part of the body.

## The Book of OUR OWN LIFE



These are some of the pipes, called capillaries, found in Jack's house. Through these pipes, which are so small that 2,000 could lie side by side in an inch, the blood runs to every part of the body, carrying the red cells, which bring air, and the white cells, the chemists that keep microbes out.

### JACK'S WONDERFUL PUMP

AND THE LIFE-STREAM THAT FLOWS THROUGH HIS HOUSE

WE have seen that the middle story of Jack's house is the pumping and ventilating story, and we know that Jack's central pump, which is to be found right in the middle of this story, is usually called his heart, and that its business is to drive the blood all through Jack's body. We must study Jack's pump, the pipes through which it drives the blood, and the blood it pumps—blood which first of all is the water-supply of Jack's house, but is also many other things of the greatest importance.

The first fact about the great pump is that it is alive. From this point of view, we might almost compare it to a horse, especially as it has a pair of reins. These reins are most important, and if they are cut by an accident, or if some poison rots them, Jack will certainly die.

The reins of Jack's heart, or pump, are called the vagus nerves, and one of them runs down each side of his neck from his brain to his heart, close beside the great pipe which we can feel beating on each side of the neck. These reins are held, so to say, by servants of Jack, who live in the lowest part of his brain, which is called the

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bulb, the lowest of the three telephone exchanges of Jack's house. So long as

Jack is alive and well, these reins are never let go, but if we wish to find out what they are doing, it is necessary to watch

the consequences of cutting them or poisoning them. If such an accident should happen to Jack we would find that the great pump, which was beating at the rate of, say, eighty times a minute, would at once begin to beat faster and faster, but that every beat would be weaker than the last until it came to a stop, having worn itself out. The commonest and best known of the poisons which act on the heart, so that it races itself to death, is called belladonna, and it is the poison found in the beautiful berries of the deadly nightshade.

But many other things besides the deadly nightshade will affect the beating of Jack's pump, either by making a pull on the reins, or by letting them fall loosely, as it were. Great pain or fear or a sudden shock of any kind will sometimes cause such a tug at the reins that Jack's heart stops on the spot, and he must die in a few seconds, unless the tug at the reins

relaxes. It usually does so very soon, and all we say in such cases is that Jack has fainted. He faints, or perhaps it is better to say he loses consciousness, because the pump ceases to send blood up to his study in his brain, and he cannot work.

On the other hand, fear and many other things may often relax the reins, so that the pump beats much more quickly and, at first, more violently. As soon as the disturbing cause is past, the reins are tightened up again, and the heart begins to beat in an orderly and quiet way as before. In other cases, we find that poisons—such as the poisons in tobacco—neither tighten the reins nor relax them, but keep on jogging at them, so that Jack's heart loses the beautiful, even smoothness it is meant to have, and commences to beat irregularly. Then the doctor says that Jack has a "tobacco heart," and shakes his head. The irregular beat tells just as quickly of damage to Jack's pump as an irregular throb tells of trouble in the engines of a great ship.

#### **THE REINS OF THE HEART WHICH ARE WORKING FOR EVER NIGHT AND DAY**

The value of these nerves, or reins, of the heart is that they are connected with every part of Jack's house, and by their action can make his pump beat slower or faster, according to the special needs of the time. Also their existence and action mean that Jack always has something in reserve for special demands. If he is chased by a bull, his nerves will relax their control for a little, and will let his heart go to serve his legs when they are much needed. But from the beginning to the end of the history of Jack's house these reins are always acting to some extent, day and night, and Jack has no better or more necessary servants than those nerve-cells in his lowest telephone exchange.

The heart itself is strictly and literally a pump—not like a pump, but actually a pump. There are two kinds of pumps, those which press, or force, a fluid to move, and those which move it by suction. The pump in Jack's house is a force-pump of which the walls are alive.

#### **THE FOUR CHAMBERS WITH THE LIVING WALLS**

But, though the heart is truly a force-pump, it is much more complicated and infinitely more wonderful than any

other pump in the world. It has four spaces, or chambers, inside it, each with its own living wall, and each with a strong and perfect valve, so that the blood can only move forward, in the direction which Jack requires. The muscular walls are made of living cells, long and narrow, which have the power of making themselves short and thick. These living cells, or muscular fibres, are Jack's humble but invaluable servants, his "drawers of water," and they are arranged in the walls of his pump in a most complicated way, which it would take a book to describe. It is these cells, or fibres, that do the actual work on contracting the heart and forcing out the blood.

The other great fact about the pump is that, at various places in its walls, it contains numbers of nerve-cells, which order the muscle-fibres to contract. But it would never do for Jack's pump to work independently, without reference to the needs of the whole, so these nerve-cells, which rule the muscle-cells of the heart, are themselves under the control of the vagus nerves, and also of another pair of nerves, which do not act all the time, but can be used on occasion. When they act they make the heart beat more powerfully.

#### **HOW THE PUMP DRIVES THE LIFE-STREAM ROUND AND ROUND**

A great Englishman, William Harvey, about whom we read in another place, found out what happens when the four chambers of Jack's pump beat and drive the blood. Harvey found that the blood goes right round the whole of Jack's house in a circle, or, rather, in two circles, which meet in the heart. The pump is really two pumps—a left pump, which drives the blood to all parts of Jack's house, and a right pump—not quite so strong—which only drives it to the lungs in order to receive pure air and get rid of foul air. We shall understand this better when we come to study the ventilation system.

We now have the picture of this great pump, which is placed in the very middle of Jack's house, and beats away, night and day, so long as he lives, driving his water-supply through a system of closed pipes, which leave his heart and return to it; but we shall not see any use in this process unless we understand that these pipes are of a very unusual kind.

## JACK'S WONDERFUL PUMP

The various pipes have various names—arteries, veins, and capillaries. Not one of these, however, has any holes in it, and, so far as we can discover by looking at this water system, it simply goes round and round within these closed pipes.

That would be a useless performance if it were so. But the smaller pipes, called capillaries, because they are as fine as hairs, are exactly what the pipes of an ordinary water-supply ought not to be, *for they let things through*, and that is the essential point of the whole wonderful system. They leak both ways, so to speak, and let all manner of things be taken out of the blood, and also let all manner of things into it through their porous walls. The whole object of Jack's pump, and of this system of pipes, is to allow this passage in and out, through the walls of the capillaries.

In one other point, above all, do these pipes differ from those of any ordinary water-supply. They are lined with living servants of Jack, muscle-cells very much like those in the great pump itself. Thus the size of the pipe in any given place can be altered at will—or, rather, not at will, for these servants are controlled from Jack's lowest telephone exchange, and not by his will at all. They are under the control, everywhere, of two sets of nerves, one set making them contract and narrow the pipes, and another making them relax and widen the pipes.

### WHAT IT IS THAT HAPPENS WHEN WE BLUSH

We see the consequences when, for instance, we blush, and feel a flood of warm blood surging through our cheeks. The order has gone forth, quite apart from or even against our will, to open the sluice-gates, and then the blood pours through into the capillaries of the face. After every meal, the walls of the stomach are made to blush in just the same way; and Jack's house could not exist if it were not for these automatic arrangements, or "reflex actions," as they are called, whereby his lowest telephone exchange controls his pump and his pipes.

And now it is time to study the marvelous fluid which is driven by Jack's pump through the system of pipes or flexible tubes which we call his blood-vessels. What is it made of? What is the good of it? Where does it come from?

In the first place, as we have just said, it is the water-supply of Jack's house. This is no small matter, for water is far more necessary in his house than in any other. It is certain that all kinds of houses which living things inhabit—animals, or plants, or men—require water. In Jack's case the water is entirely taken in by his mouth—not by his skin at all; just as, in the case of a tree, the water is all taken in by the roots, not by the leaves, no matter how wet with rain or mist or dew they may become.

### THE PRECIOUS THINGS THE RIVER CARRIES

The water which enters runs down Jack's red lane, and is picked up by the capillaries that line the walls of his great corridor. Then, of course, it forms part of his blood, and is driven along by Jack's pump. The other half of the story is that, just as the water leaked *into* the pipes at one place, so it leaks *out* of them at others after its work is done. It is always doing so.

The water which enters the blood from the central corridor leaves it by leaking through the capillaries of the kidneys, the capillaries of the skin, and the capillaries of the lungs. This leakage of water never stops—it is always going on. Every breath we breathe out contains water; water is always leaving by the skin, and water is always being filtered through the kidneys. In all these cases the water carries with it rubbish, so that Jack's water-supply is also a drainage system.

### THE FOOD FOR JACK'S MILLIONS OF SERVANTS

Jack's system, however, is no ordinary water-supply. It is a river of life, ever flowing, and carrying on it, or, rather, in it, many things just as necessary for the house as the water itself. Indeed, after food has been chopped up and cooked in the kitchen, all the useful parts of it are taken into the blood, just like the water. The pump, therefore, sends through the body not only water but also the food necessary to build it up and keep it in repair.

Here, again, comes in the beauty of the fact that the smallest pipes of this water system are so thin that they leak; and, more especially, that they leak in such a way that they let through only what is wanted. For now we come to the *real* eating that goes on in Jack's



house. All his millions and millions of servants require food, and one of the great duties of his pump is to carry their food to them as they work away in the dark.

#### THE RED AND WHITE SERVANTS WHO GET OLD IN SIX WEEKS AND DIE

Thus the blood which is always being pumped from the heart, and has first reached the heart carrying all kinds of food and fuel from Jack's central corridor, is sent to every part of Jack's body; and leaks through the walls of the capillaries, together with much water, producing a fluid called lymph, which is the prepared food for all Jack's servants—the chemists in his laboratories or glands, the strong slaves that make up his muscles and so on. So the blood is not only water, but food also, for Jack's living servants, and it is just because they require food and water that Jack requires them.

This rushing life-stream, which carries food everywhere, is crowded also with living servants of Jack, some white and some red. The red ones never leave the stream. They are born inside Jack's bones and join the blood as it flows through the marrow of the bones. Then, for about six weeks, they travel round and round Jack's body, until they grow old and die, and break up. All this time their important duty is to carry fresh air from Jack's ventilating system to every part of his body.

#### THE WANDERING CHEMISTS WHO HELP JACK IN TIME OF DANGER

Jack's living servants are always breathing, and need air. A little air can be dissolved in the blood and carried along, but not enough for the needs of Jack's servants. The rest is carried by the red porters who inhabit his blood, and as they pass through thin-walled capillaries they give up this air, and then are pumped along until they reach Jack's lungs again, where each of them is again provided with a load of the fresh air that he has just breathed in.

If there are too few of these red porters in Jack's house, he is pale, gets out of breath too easily, and suffers from headache. Sometimes, however, if he swallows a little iron for a few weeks, his red bone-marrow will make many new red porters, and he will grow better.

The other inhabitants of the blood are the white cells, which carry part of

Jack's fuel from his great corridor to his liver. It has been discovered, too, that they are a sort of wandering chemists, who produce special substances for the benefit of Jack's house. For instance, if one of Jack's blood-vessels is broken, by a cut or a scratch, or in any other way, of course the blood begins to leak out all together; and if this went on long enough, Jack would die. But the white chemists of his blood produce, just at the right moment and the right place, a substance which coagulates the blood or turns it solid, so that it flows no longer, and the bleeding is stopped.

But we never see the white cells at their bravest until a burglary occurs in Jack's house—a thing which often happens. We shall find how the white cells are prepared to die by millions for Jack, and how they kill the intruders who seek to kill him. The whole story is wonderfully interesting.

#### HOW YOU MAY FEEL THE GREAT PUMP BEATING

Now put the forefinger of one hand on the front of the other wrist, and feel your "pulse." Then feel another pulse at the side of your neck, and then another which crosses the hard bone just in front of your ear. These are a few of the places where we can notice how the pipes swell at each beat of the great pump—swell to the fluid which is water-supply, food-supply and air-supply, and in which swim porters and soldiers. If the pump beats eighty times in a minute, think how many times it must beat in a life of eighty years, resting only between the beats, and with no wages but just enough to keep itself going.

This is the tireless, faithful heart, and we need not wonder that in all languages it is the symbol of courage which no dangers can daunt and of service which is true till death. Some of our most interesting expressions which describe bravery or cowardice make use of the word "heart" to strengthen their meaning; such as "brave-hearted" and "true-hearted," or "faint-hearted" and "down-hearted." The heart is the seat of life, and according as the heart is a good heart or a bad heart the whole body is affected, and it is the same with the character of a boy or girl, whose heart is good and true or weak and cowardly.

CONTINUED ON PAGE 6230.



SHAKESPEARE

# The Book of MEN & WOMEN



MILTON

## TWO MEN WHO TAUGHT THE INDIANS

HERE and there in the Book of the United States and in the Book of Canada you have read about the devoted band of Jesuit priests who went about among the Indians, and braved death by torture at their hands, that they might teach them to become Christians and give up their cruel, treacherous ways. One of the most distinguished of these men was Pere Jacques Marquette, who is known simply as Pere or Father Marquette, a gentle, kindly man, who won the love of the Indians among whom he taught. Twenty years before Pere Marquette began his mission to the Indians in the West, John Eliot, a Puritan clergyman, had begun to teach the Indians of Massachusetts. He preached to them and taught them for fifty years, and reduced their language to writing and translated the Bible for them. This story tells us of the lives and work of these two great men.

## A PRIEST WHO LOVED THE INDIANS

AWAY in France in an old chateau in the city of Laon, which stands on the banks of the River Oise, a little boy named Jacques Marquette was born some hundreds of years ago. Jacques was a round-cheeked, joyous-hearted little fellow with generous, impulsive ways which won the hearts of all about him. The servants adored him, and Jacques' mother thought there was no other boy like him in all the wide world. Madame Marquette was a devout Roman Catholic, and she would often entertain Jacques for hours by telling him tales of the brave Jesuit Fathers who went out into far-away lands to carry the gospel of Jesus Christ to the heathen. Little Jacques, sitting on a hassock at his mother's feet and propping his curly head against her knee, would listen with shining eyes and parted lips to the stories of daring and self-sacrifice.

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reached the little mission on Lake Superior in the heart of the wilderness, to which he had been appointed. Once there, however, Father Marquette set to work with vigor and enthusiasm. He began to learn the languages of the various Indian tribes, and then in an earnest, simple way told them how Christ had come down to earth to die so that all men might be saved.

The Indians listened perplexedly. At first they did not understand this white man with the long black robe, who went about with a strange look in his eyes and who talked about a Manitou who was all love. He did not seem like the white men they had met before. He did not seem to want anything for himself, and he would travel many miles in the middle of the night to help a sick child with his simple remedies. Gradually the Indians began to trust, and then to love him. They listened, too, to what he had to teach, for surely one who had no ends of his own to gain must speak the truth.

By and by the fame of the "Young White Father" spread abroad, and Indians from the more southern tribes began to come to hear him. One day there arrived at Father Marquette's little mission a delegation of Indians from the tribe of the Illinois, who lived far away on the "Great River." The strangers listened to Father Marquette

"Perhaps some day you may become a Jesuit Father, who knows?" she would say.

The years passed and the rosy-cheeked little boy grew into a tall young man, with earnest eyes. His mother's cherished dream came true. Jacques became a Jesuit priest, and one day he said good-bye to all his friends and set sail across the Atlantic for the great, new land of America. Traveling in those days was very slow, and it was many months before the young priest

JULIUS CAESAR

HERBERT SPENCER

as he preached, and then they presented themselves before him

"Let the Young White Father come to the people of the Illinois," they said.

"I cannot leave my mission now, but I will surely come," promised Father Marquette, his heart aglow within him at the thought of this wonderful opportunity.

From this time on Father Marquette made it his special prayer that the way might be opened to him to go to the Indians of the Illinois. One day there arrived in the camp a small band of men under the leadership of a young man named Louis Joliet, who had been sent by Count Frontenac, to explore the "Great River." Father Marquette was instructed to go with him on the journey. It seemed so like a direct answer to his prayer that the good priest was filled with thanksgiving, and he eagerly prepared to join the expedition.

The journey began one bright spring morning late in May. The adventurers launched their canoes and paddled gaily over the sparkling waters of Lake Michigan to Green Bay, where they found an encampment of the Wild Oats Indians, who crowded around the white men. Father Marquette was able to talk to them in their own language, and he told them that his party was bound for the "Great River." The Indians listened to his words in polite silence, but when he paused, they tried earnestly to persuade the voyagers not to go forward.

"What are they saying?" asked Joliet, curiously.

"They say," said Father Marquette, "that we will surely be killed. They say that there are wild Indians and great water monsters and a horrible river demon." He turned to the Indians and spoke with a ring of triumph in his voice. "People of the Wild Oats," he said, "the white men are not afraid of river monsters or demons, for they have with them always the spirit of the great Manitou, who will let no harm happen to them."

Then the white men bade good-bye to the wondering Indians, and set out to paddle up the Fox River. The upper course of the stream was so shallow that the adventurers were obliged to carry their canoes and walk along the bed of the river. The way was rough, and often the sharp stones cut through the men's

moccasins, but the party was in high spirits. As they marched sturdily along, now and again one of them would break into a rollicking French song, and the others would take up the refrain in a resounding chorus. Joliet and his followers were filled with excitement at the prospect of adventure, and Father Marquette was radiantly happy in the thought that he was going into a strange land, perhaps to death, on his Master's business.

When they had gone to the head of the Fox River, they made a portage, that is, carried their canoes across the country to the Wisconsin River, and soon were floating on its pleasant waters. After a week on this river, they reached the Mississippi on June 17, 1673. The enthusiastic young missionary wrote that he saw the great river "with a joy that I cannot express."

Day after day, week after week, they journeyed down the "Great River." They encountered strange scenery, strange animals, strange birds and strange tribes of Indians of the interior. Wherever they came upon an Indian encampment, Father Marquette preached the gospel of Jesus Christ. "I know not whether they understood what I told them of God and the things which concerned their salvation. But it is a seed cast in the earth, which must bear its fruit in season," he wrote in his diary with his engaging hopefulness.

A thing that is strange to record, compared to every other narrative of the time, is that there was no quarrel between captain and priest. Father Marquette and Captain Joliet got along famously. The captain respected the shrewdness and good judgment of the young priest and often sought his advice. Joliet himself had studied to be a priest, but the wild, free life of the woods drew him away from his books to make him a famous explorer.

Although intent upon making converts of the Indians, Father Marquette was also keenly interested in the exploration end of the expedition. He tasted the mineral waters of Wisconsin; he tested on his paddle the colored clay used by the Shawnee Indians for coloring their skins; and he cheerfully wielded his canoe paddle with the best of the men. The two men were well matched.

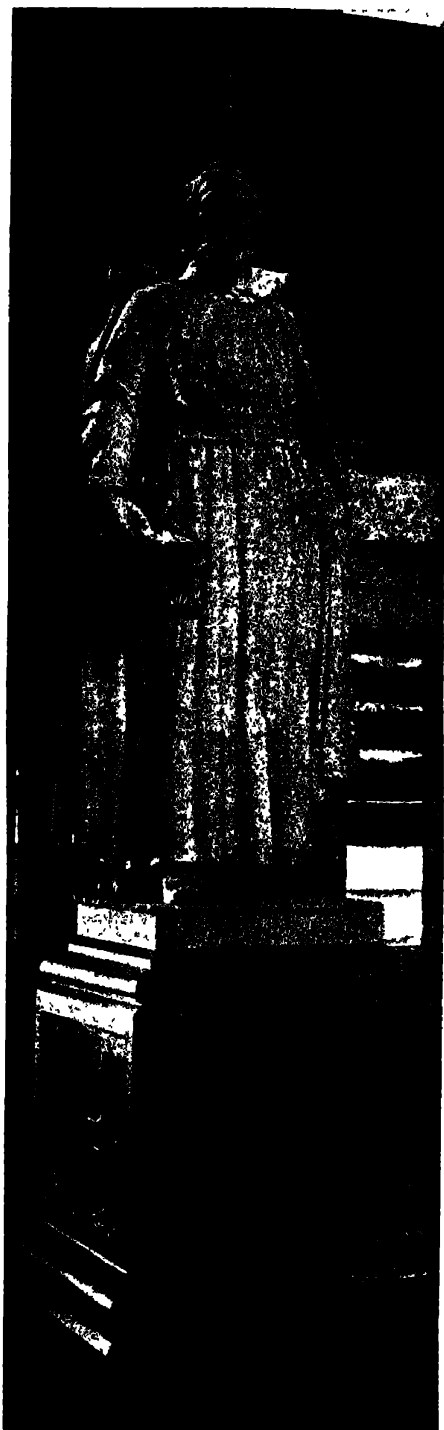
As they got further and further down

the Mississippi, the heat became intense and the mosquitoes were so thick that they were almost unbearable. The explorers found that the Indians on the lower river slept on high scaffoldings, under which they built a smudge fire, and they too were obliged to resort to this method to escape the swarms of stinging insects. At last a few days more would have brought them to the mouth of the Mississippi, but Joliet had heard that the Spaniards were in possession of the land around the Gulf of Mexico, and after a consultation with his men, he decided to turn back.

On their return they turned into the Illinois River and paddled up to its source. Then they carried their canoes across to Lake Michigan. It is thought that they reached the lake near the present city of Chicago. Then they paddled up Lake Michigan to Green Bay again. In four months they had traveled more than 2,500 miles in their canoes.

On the way back they passed through the village of the Kaskaskia Indians, who begged Father Marquette to remain with them and establish a mission. But the young priest's health had been seriously affected by the tropical heat of the mid-summer sun and the unwholesome, moist climate of the lower Mississippi, and he was now very ill. He was very loath to leave the Kaskaskia without telling them of his "glad tidings," but his companions refused to leave him behind in the wilderness, and Father Marquette, who was too weak to protest, promised to return to the interior as soon as he was well.

When he was again able to travel, he set out with a little band of his convert Indians to keep his promise to the people of the Kaskaskia, but he got no further than the present site of Chicago, when he was again attacked by his terrible disease, so he was obliged to stop on his journey and spend the winter among the Indians of this region. As in every place where he had gone, he soon won the devotion of the Indians of the Chicago tribes. From all around they came to listen to the inspired words of the "Young White Priest." The Indians believed in Father Marquette and loved him as they believed in and loved no other white man. And why? Because he believed in them and loved them as no other white man had ever done. He saw no guile, nor treachery in the Indians. Where others saw only bloody, repulsive savages, he saw men—red, in truth, but with unselfish,



In the Capitol at Washington there stands a statue, erected by the State of Wisconsin, in honor of the brave missionary priest, Father Jacques Marquette, who was one of the first white men to explore the Mississippi River. The story of his life is a beautiful one, and it is no wonder the Indians loved him.

hospitable, generous natures and a deep religious sentiment.

In the spring of 1675, Father Marquette was again stronger, and he went on to the Kaskaskia to establish the mission, as he had promised. Here illness again overtook him, and he set out for Canada, accompanied by a handful of his Indian friends, to die among his own people. Day by day, as they hurried northward, the young missionary grew weaker, until at last, when they reached Lake Michigan, he knew that the end was near. He had met all his pains cheerfully and uncomplainingly, and now he faced death with a sort of exultant joy—joy that he should be allowed to die in his Master's cause. Quite simply he told his Indians that he was glad to go, and spoke

of the joy that awaited him. Then he asked to be carried to a little hillock that overlooked the lake.

"I thank you for your patience with me in my sickness," he said. "I am sorry to have given you so much trouble."

Then he told them to go to sleep and get a little rest. He would call them when he felt that death was coming. For a while he remained in silent prayer. Presently he called, and there in the wilderness, surrounded by a handful of devoted Indian converts, Father Marquette died at the age of thirty-eight. His bones were not allowed to remain in the wilderness, but were carried by some of his Indian converts to the chapel of the Mission of St. Ignace, which had been founded further up the lake.

## JOHN ELIOT, THE APOSTLE TO THE INDIANS

WHEN Pere Marquette was a curly-haired boy, listening to his mother's stories, John Eliot, the great Puritan teacher, had already begun the work among the Massachusetts Indians which won for him the name of "The Apostle to the Indians." He aimed at nothing less than providing Indian teachers as missionaries to spread the gospel among their own people, and at that very time he was engaged in perfecting his knowledge of their language that he might be able to teach them to read.

John Eliot was born in England, in 1604, probably at a little town called Widford, in Hertfordshire, where he was baptized. We know little about his boyhood, except that he had a happy home, and was well taught, so that at the age of fifteen he was able to enter Jesus College, Cambridge, where he graduated at the age of nineteen. His father, Bennett or Benedict Eliot, was a yeoman, that is, a man who owned his land, but had not a large estate. He died when his son John was seventeen.

After he left the university, young Eliot became assistant in a school, where he taught for about seven years, and a delightful teacher the boys under his care must have found him. Some time during these years it is believed that he was ordained, and possibly he preached to the people among whom he lived. Certainly, he gained their friendship and confidence, and before he sailed away to

the New World, a number of them told him that they would follow him, and gained his promise that he would be their teacher. By this time Thomas Hooker, the principal of the school in which he taught, and probably John Eliot himself, had fallen under the displeasure of Laud, the Archbishop of Canterbury. The school had been broken up, Thomas Hooker had already left the country, and in 1631, John Eliot sailed for Boston to begin life there. The good ship *Lion*, in which he sailed, made a prosperous voyage. Ten weeks after he embarked he landed in Boston, where the people held a day of thanksgiving for the safe arrival of the ship, which also brought Governor Winthrop's wife and children. Throughout the winter, John Eliot ministered to the church in Boston, for Mr. Wilson, the pastor, had gone to England to bring his family to their new home. The young teacher won the love of the stern Puritans of Boston, but they could not keep him, for early the next year his friends arrived, as they had promised, and made a settlement at Roxbury, and in accordance with his promise, he went to them.

The following year, Hannah Mumford, or Mulford, to whom he had been betrothed in England, joined him. There was a simple wedding in Boston, and they began their long and happy life together in Roxbury. For sixty years thereafter, he taught and preached in Roxbury, and took

## TWO MEN WHO TAUGHT THE INDIANS

a prominent part in the church affairs of the little colony. He was one of the three men who arranged the Bay Psalm Book, of which you remember we have spoken in the story of Songs and Song Writers. He was prominent, too, in educational matters, and was one of those who signed an agreement to build a free school in Roxbury and support a schoolmaster.

While he went about his duties, the state of the Indians weighed heavy on his mind. He was a man of loving spirit, and their savage life and pagan beliefs grieved him sorely. At length he took

grammar for it, and when that was done he translated the Bible into it. This took time of course. First he translated a little catechism, then the Book of Genesis, after that St. Matthew's Gospel, and so he went through the whole Bible, bit by bit. This translation of the Bible into the Indian tongue was the first book printed in New England.

Meantime he continued to teach the Indians, and to help them to live in a better way, he founded a town for them at Natick, where they learned to cultivate the land set apart for them, and he



John Eliot Preaching to the Indians.

into his house a young Indian, from whom he set to work to learn the language of the Pequod tribe so that he might teach them, and in 1646 he preached his first sermon in the Indian tongue in the wigwam of Kitchomakin, in a grove at the mouth of the Neponset River.

But this good man was not content to teach the Indians by preaching to them. He wanted them to believe intelligently the things that he taught them, and he wanted to raise them up from the wretched way in which they lived. Not content with learning to speak their language, he set himself to the task of making it a written language, and making a

taught them that cleanliness is next to godliness. His converts learned to read, and before admitting them to the church, he demanded that they should follow the stern rule of life laid down by the Puritans.

Every other Sunday, year in and year out, he went on horseback from Roxbury to Natick, which is some miles away, and it is said that his horse's feet made a beaten path through the woods. Stern though he might seem, he was sweet and loving and gracious and of a humble spirit. Always his horse was laden with comforts for the Indians, and his pockets were filled with cakes and apples and goodies for the children, whom he loved.

"The care of the lambs," he wrote, "is one third part of the charge over the work of God." When years told on his frame and his friends tried to induce him to give up his labors for the Indians he refused, saying, "I will never give over as long as I have legs to go." He firmly believed that the Indians were the remnants of the Ten Lost Tribes, of whom you have read in the Story of the Scattered Nation. He hoped to bring them back to the state from which he believed they had fallen, and so he labored for them year after year. In one winter he translated the whole Book of Psalms. At first he preached under a great oak tree, which still stands at Natick; but after a time a church was built, in which there was an upper chamber, where the apostle might spend a restful night after the labors of a day of preaching and teaching were done.

Not content with teaching at Natick, he went on missionary journeys, and it is said that he traveled through the woods from Cape Cod to Concord. At first he not only had to face the danger of capture and torture by hostile Indians, and to work against the opposition of the Indian chiefs, but he was also opposed by the settlers, who believed that no good could be gained by teaching Indians. Nevertheless he persevered. As the years went on many converts were made, and there were no less than seventeen villages of what were called "praying Indians." But in 1675, an Indian chief, known as King Philip, made war against the English settlers. He and his followers and allies committed such cruelties that the settlers were roused to a state of fury against all Indians, and though few of John Eliot's converts joined Philip, they were all removed from their villages to Deer Island and to Long Island in Boston Harbor. After a time, at John Eliot's earnest request, they were allowed to help the settlers to overthrow Philip, and later they were permitted to return to Natick, and three other villages, but the Christian settlements were never so strong again. After the war was over, John Eliot protested against the sale of Indians as slaves. His charity was never failing, and it is known that at his own cost he brought back one man who had been sent to Jamaica, and also redeemed the wife and children of this man.

In 1687 the greatest grief of his long

life came to him when his wife died. All his life she had been his greatest helper. It was she who looked after the household, and saved him from all worry about his money affairs, so that he might devote himself to his teaching and translations. "I shall go to her," he said, "but she shall not return to me," but he lived on three years longer and died at the age of eighty-six. "No missionary," one of his successors says, "who ever labored for the gospel, had a nobler zeal; no martyr who ever faced the flames had a more heroic spirit; no saint had a saintlier soul. His missionary spirit and earnestness were as wise as St. Paul's, his charity and sympathy as sweet as St. Francis d'Assisi's, and as years go on he becomes one of the most commanding figures among all the English Puritans who entered into the early life of America."

An Indian missionary, who had been ordained some years before John Eliot's death, tried to go on with the work among the Indians, but he had not the authority that a white man would have had among them, and he was not successful. John Eliot was almost alone among the settlers in his belief in the Indians. His son John, whom he had trained to take his place, died over twenty years before him, and no one had enough interest in the mission to carry it on. Gradually the Indians fell away, and in 1716 their church was closed. Another church has been built on the site where it stood, and close by a monument has been erected to this self-sacrificing missionary, who was one of the very few to claim justice for the Indians, and to seek to teach them how to take their place in the civilization of the white men among whom they had to live.

He saw very clearly that as long as they kept to their old ways of living it would be very hard for them to hold to the truths of Christianity, which he taught them. He believed that if they were to be really Christians, they must learn the ways of Christian civilization.

His efforts as a pioneer in education are overshadowed by his fame as a missionary, but the people of Roxbury do not forget that he never ceased to declare the need for education in the colony, and that the year before his death he gave seventy acres of land at Jamaica Plains to support a school.

THE NEXT STORY OF MEN AND WOMEN IS ON PAGE 6171.

## INDIANS OF THE WEST AND OF THE EAST



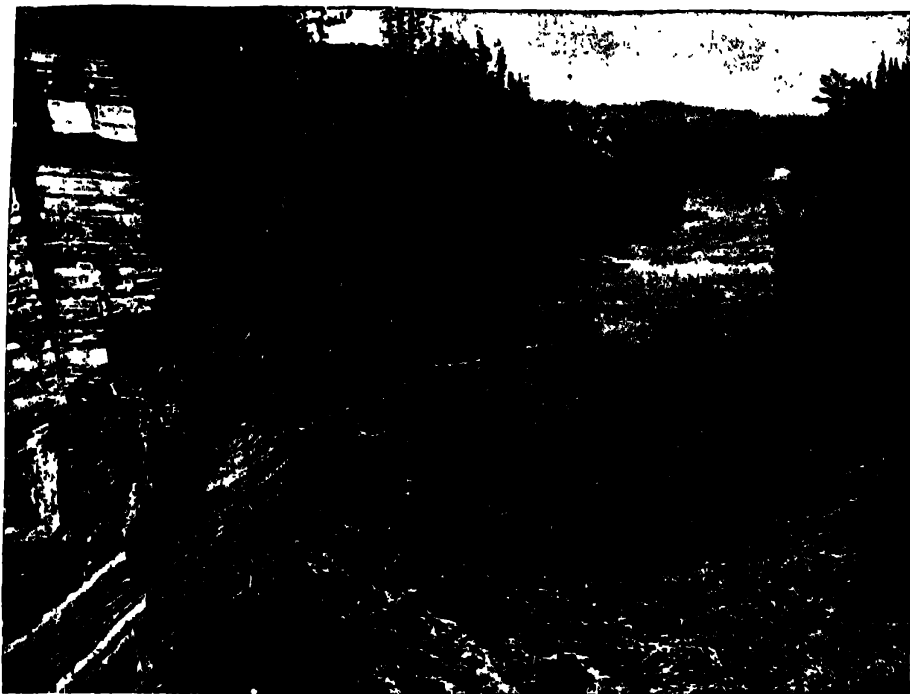
Father Marquette and Louis Joliet floated down the Wisconsin River into the Mississippi, June 17, 1673, and here we see them lost in wonder at the sight of the mighty stream. You can read the story of their voyage down the river, and of their return trip, in the text. This was the first real exploration of the course of the river, though it had been discovered long before.



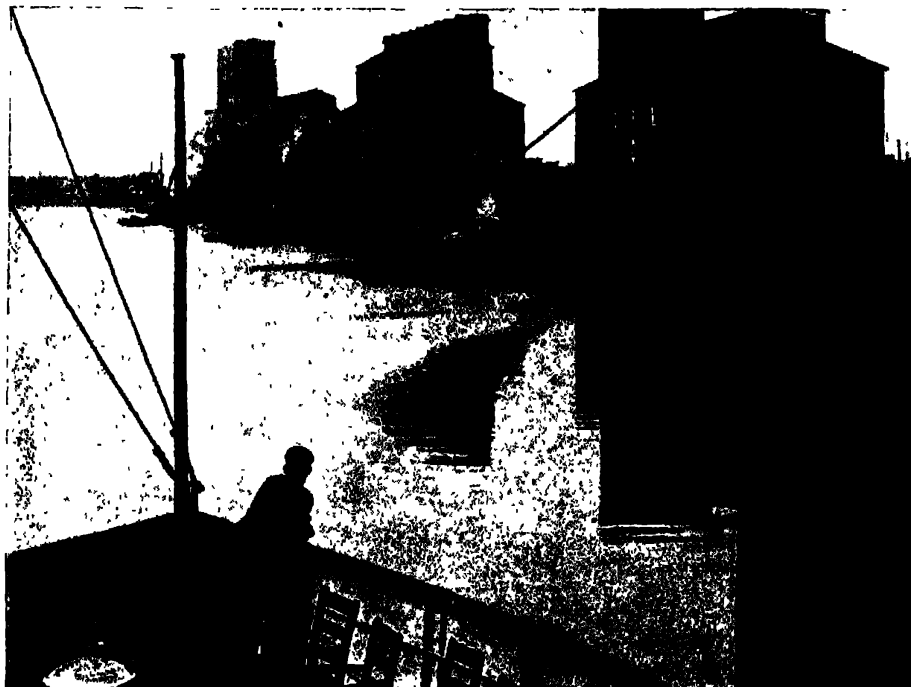
King Philip, whose real name was Metacombet, was a chief of the Wampanoags, and plotted to kill all the whites in New England. War broke out in 1675, and raged for over a year. Philip was finally killed by an Indian in 1676. This conspiracy almost broke up the work which John Eliot had done among the Indians, as some "praying Indians" could not resist the temptation to join Philip against the whites.



## ONE OF CANADA'S RIVERS



One of the most beautiful rivers of Canada is the Kaministiquia. We show you here its more restless appearance, as it dashes over stones and apparently struggles to be free. Notice the different strata in the rocky banks through which the river has cut its way. The beautiful Falls of Kakabeka are on this river.



Here is the same river, though you can hardly believe it. This quiet and placid stream with the grain elevators along its banks and the steamers on its waters seems entirely different from the restless stream above. The town is Fort William, Ontario, which is a centre of the grain trade.

Pictures copyright by H. C. White Co



The Canadian Side, Niagara Falls.

## THE GREAT LAKES AND THE ST. LAWRENCE

**H**ISTORIANS tell us that rivers have a great influence on the destiny of nations. A writer of geographies has lately called the St. Lawrence a roadway into the heart of the continent. Before we set out on our journey down the pathway made by this noble river, let us stop for a moment, and think of the influence that it has had on the history of Canada.

Up this great and shining roadway came Cartier on his voyage of exploration. Champlain followed it. The farms and villages of the early settlers were built along its banks. La Salle made his way along it on his way to find the Mississippi, and it was the road by which the adventurers, who followed after him, traveled when they sought to bar the valley of the Mississippi from the English colonies in the East. If it had not been for this great highway, it may be that the history of this whole continent might have told a different tale.

### HOW THE GREAT LAKES WERE MADE

Once on a time, you know, there was no river and there were no Great Lakes. All the northern part of the continent was covered with ice which

CONTINUED FROM 5918



filled the valley. Now if you look at your map, you will see that the centre of the whole continent is a great plain. But as you trace the courses of the rivers you will find that the southern portion of the plain is tipped toward the south. In the centre there is a low height of land. The rivers to the north of this flow toward the north and east, while those on its southern side flow southward. If it were not for this height of land, it is probable that the water from most of the lakes would flow to the Mississippi and the St. Lawrence would not exist. It is strange to think that a little height of land, which was perhaps pushed up by a glacier, far back in the ages, could alter the history of the world.

In the glacial period—the time of cold—all the northern region was covered with ice, which, as it moved onward, scraped the sides of mountains bare, ground out basins, deepened valleys, and in other places raised the surface of vast tracts by overlaying the land with the drift of earth and rocks it carried. Ages passed, and the air became warm again. The ice melted, and in its place a great expanse of water re-

mained But the water found outlets, as water will. Gradually the higher land was drained, but the deep basins held their water, and this was the origin of the chain of Great Lakes and the River St. Lawrence, which flows through them and carries their overflowing waters to the sea. We call them lakes; but really they are inland seas, and hold within their deep basins half the fresh water there is in the world.

**WHERE THE ST LAWRENCE REALLY BEGINS**

We usually think of the St. Lawrence as rising in Lake Ontario. Really it rises in Lake Nipigon, north of Lake Superior, and flows down through all the lakes, though we call it by different names. The lakes are like the fountains, made in steps, that you sometimes see. The water overflows from one into the other, but the stream is continuous. The St. Lawrence with its tributaries drains over four hundred thousand square miles of territory, most of it in Canada.

On this trip, our starting place is at Fort William, at the head of Lake Superior, where we have come to meet a beautiful steam yacht that is to take us down through the Canadian waters of the lakes. Fort William was a headquarters of the Hudson's Bay Company, and every year the officials held high festival there. But the days of the Fur Company are gone. Wheat is king in Fort William, and huge elevators mark its power. The golden grain is gathered in these elevators from the prairie lands, and much of it is shipped by boats which go down the lakes, canals and river to Montreal.

We shall not see the wild and rocky northern shore of Lake Superior. We pass out of the harbor, pass Thunder Cape and Isle Royale, and keep almost a straight course across the lake. At White Fish Bay we pass the lighthouse and find the entrance to the Sault Ste. Marie, where the overflowing ice-cold waters from Lake Superior plunge themselves down the rapids to reach the lower level of Lake Huron. The rapids are so dangerous that canals, of which we may read in other places, have been built to make a passage for the ships; but while our boat makes her slow way through the lock, we hire an Indian guide and his canoe and shoot the rapids, as the Indians, the early French, the coureurs-de-

bois, and many a hunter and trapper in long procession have done before us.

**THE BEAUTIFUL REGION OF GEORGIAN BAY**

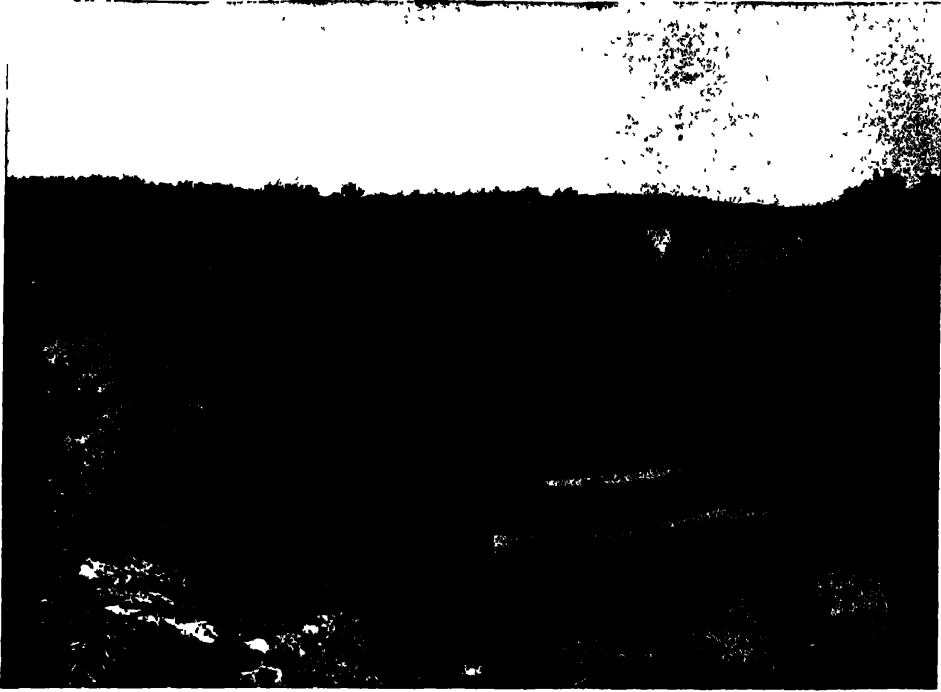
After we have passed the canal at Sault Ste. Marie, which we remember means the Falls of St. Mary, we sail down the St. Mary's River, as our river is here called, into Lake Huron. We should like to pass down below the island of Mackinac into Lake Michigan, which is surrounded by the state of Michigan. We want to see Green Bay, where La Salle landed, and the great city of Chicago, which has grown up on the site of Fort Dearborn, but our host tells us we must leave that for another time. Our captain turns the bow of our staunch little boat across Lake Huron, past Pelee Island, famous for its grapes, between Manitoulin and the mainland into Georgian Bay, one of the most beautiful stretches of water that the world holds. Islands meet the eye on every side; some of them are rocks, some of them little islands with a tree or two, thousands large enough for a summer cottage or a camping place.

North of Lake Huron, in the Sudbury district, are the great nickel and copper mines, of which we have read on page 6092, and on Manitoulin Island there are copper mines, but our minds are filled with the beauty of the scene and we have little thought left to-day for natural resources. We take our leisurely way through the islands, and stop at the little town of Collingwood, where great freight ships are built. We stop at Owen Sound, then sail out again into Lake Huron, through the St. Clair River, and Lake, and the Detroit River into Lake Erie. Now we sail along the southern shore of the peninsula to Port Colborne, where we enter the Welland Canal, and enjoy the novel experience of steaming down its placid waters through fields and country villages to Lake Ontario. Once we have reached the lake, we leave our yacht, and take the train for a visit to the Falls of Niagara, those famous falls that the Iroquois called the "Thundering Water."

**WHERE THE "THUNDERING WATER" COMES FROM**

Let us think for a moment what this thundering water carries. Back of it are four of the Great Lakes, Erie, Huron, Michigan, and Superior. When the over-

## THE MARVELOUS RIVER



No part of the St. Lawrence is more beautiful than the section including the Thousand Isles. Some of the Islands, as you see, are only ledges of rock standing above the water, others are very large and on them are built the cottages of the summer residents. Some of these are really palaces.



In the text you are told of the excitement of running the rapids of the great river. Here is just the edge of a boat going down the Long Sault Rapids, one of the most dangerous of the whole series. The pilots are so skilful that an accident is almost unknown.

Pictures copyright by H. C. White Co

flow from all these lakes enters the Niagara River, it flows quietly between its wide banks until it reaches the rapids a little way above the Falls. At the head of the rapids, the waters begin to hurry, hurry, hurry, as if in haste to make the adventurous leap beyond, and when they reach the brink of the chasm, down which they must roll to the lake, they leap forward into the abyss, a hundred and sixty feet below. We cannot tell what impresses us most, the hurrying water at the rapids, which we could watch for hours, or the sublime spectacle of the great mass of water as it leaps into the chasm below. From the foot of the precipice the water rushes down a steep incline between narrow banks, to the whirlpool, where it strikes against a jutting point of land and is sent back in a sweeping current to swirl round and round before it escapes. We follow down its steep banks, fascinated by the swirling waters that rush by far below our feet until at last they reach a gentle slope, and flow quietly down to meet the blue waters of Lake Ontario. The great water power from the Falls is used to work factories and run electric railways from Buffalo to Toronto.

#### KINGSTON, THE WEST POINT OF CANADA

At Niagara-on-the-Lake, which we remember was once called Newark, and was the first capital of Upper Canada, our yacht meets us, and we sail across the lake to Toronto. Passing by Burlington Beach, we keep within sight of the land, for there are many pleasant places along this shore. We make no stay at Toronto, for our vacation time is drawing to a close, and we have much to see, so we go on our way straight through the lake until we reach the city of Kingston. The city is beautifully situated where the St. Lawrence flows from Lake Ontario. Most of the buildings are of gray limestone, and so it is called the Limestone City. It is a quaint, attractive place, full of historic interest, for it was built on the site of Frontenac's fort, and was once the seat of the government of Canada. The Military College, Canada's West Point, is here, and Queen's University ranks with Toronto University and McGill. The massive gray stone forts, the quaint Martello towers, and the imposing public buildings, all make the city very full of interest.

Opposite the city, the St. Lawrence leaves Lake Ontario. Seldom less than two miles in width, it is two and one-half miles wide where it issues from Lake Ontario, and with several expansions which are called lakes it becomes eighty miles in width where it ceases to be called a river. The influence of the tide is felt over five hundred miles from the gulf, while it is navigable for sea-going vessels to Montreal, eighty miles farther inland. Rapids prevent navigation above this point, but by means of canals, boats pass from Montreal to Lake Superior.

If inferior in breadth to the mighty Amazon, if lacking the length of the Mississippi, if missing the ancient castles of the Rhine, if wanting the lonely grandeur that overhangs the Congo, the majestic St. Lawrence has features as remarkable as any of these. It has its source in the largest body of fresh water upon the globe, and among all of the large rivers of the world, it is the only one whose volume is not sensibly affected by the elements. In rain or in sunshine, in spring floods or in summer droughts, the river seldom varies more than a foot in its rise and fall.

#### THE THOUSAND ISLANDS

Where the great Laurentian chain of mountains, running from east to west across Canada, swings southward to enter New York, it drops a link as it were, and allows the last of the big lakes an outlet into the channel of the St. Lawrence, which moves sluggishly among the numerous islands, helping to form the most picturesque archipelago in the world. The actual number of islands in this Lake of the Thousand Isles is near two thousand, varying in size, shape and appearance from a small barren rock, projecting from the surface of the river, to larger ones ornamented by summer residences varying in style of architecture from the modest cottage of the camper to the magnificent castle of the millionaire; and finally islands of large area covered with many farms.

Leaving Kingston, we wind in and out among these charming islands to the American town of Clayton, noted as a summer resort. Below this thriving town, island after island studding the quiet waters rises into view, the finger-tips of the great mountain range.

On one of these larger isles is located the "Thousand Island Park," while a little below is the fashionable resort known as the "Saratoga of the St. Lawrence," Alexandria Bay.

From Clayton to Chippewa Bay the river with its clustered isles is like a fairyland. Hundreds of islands lie across the course of the steamer, all differing in size, coast, coloring, and forming an intricacy of channels amid which only an experienced pilot can guide a boat. Now we are entering a narrow pass between cliff-like banks covered with moss and trailing creepers, then we open into a lake-like expansion, then again among winding courses, through clustering islands and round rocky points. Everywhere art has combined with nature to enliven the scene. Islands are dotted with cottages in all sorts of picturesque surroundings, some perched on rocky bluffs showing among the trees, others snugly resting on low-lying islands or nestling in beautiful coves along the mainland. During the summer season the grand illumination of the islands takes place on Wednesday and Saturday evenings, when the entire region is transformed into a fairyland which must be seen to be appreciated.

The last of the Thousand Islands are called "The Three Sisters." Scarcely have we emerged from the still lingering images of the beautiful island scenery when the spires and roofs of the Canadian town of Brockville come in view. This town, named after General Brock, is built on an elevation which ascends by successive ridges from the St. Lawrence. A few miles below, Ogdensburg on the American side and Prescott on the other, stand like sentinels long on duty.

#### THE RAPIDS OF THE ST. LAWRENCE

At Prescott we leave the yacht, which we send down through the canals, and change to a river steamer with large observation decks. Soon after the last glimpse of Prescott fades in the distance we enter the Galops, the first of the series of rapids marking the downward flight of the waters. These are only a foretaste of what is to follow. We rapidly pass the picturesque Canadian towns of Cardinal and Iroquois. A little distance below Iroquois the Rapids du Platt swirl their dark green waters among a group of wooded islands. After

shooting the du Platt, the steamer glides with increasing motion past a picturesque point named Woodlands, and in and among bolder shores on the north side of Croyles Island into sight of the turbulent waters of the Long Sault with its snow-crested billows of raging waters. This, the greatest of the really remarkable rapids of the St. Lawrence, extends about nine miles down stream to Cornwall and is divided into channels by numerous beautifully wooded islands.

The "shooting of the rapids," as the descent by boat is called, is a most exciting experience. Navigation of the Long Sault requires exceptional nerve and precision in piloting as well as extra power to control the helm; hence the rudder is provided with a tiller besides the regular apparatus, while four men are kept at the wheel to ensure safe steering, and as a result of such precautions accidents are unknown.

The St. Lawrence expands below Cornwall, forming the beautiful Lake St. Francis, twenty-eight miles in length. Below the lake we enter the Coteau Rapids. These rapids, about two miles long, are very beautiful and have a very swift current. About seven miles further down we sweep past a small island where the trees almost dip into the hurrying stream, and rounding a sharp curve we enter the Cedar Rapids. On the left is a beautifully wooded island and on the right is Hell's Hole, the greatest commotion in the river from Kingston to the gulf. These rapids are very turbulent and the passage is very exciting. Scarcely has the boat left the Cedar Rapids before she enters the Split Rock Rapids, with many submerged boulders guarding the entry. One cannot restrain a shudder as the ship approaches these threatening rocks, but the skilful hand of the helmsman turns the boat aside and it passes by unharmed.

A short distance below are the Cascades, the last of this series of rapids, made conspicuous by white-crested waves which mount tumultuously from the dark green waters in a choppy, angry way. This group of four rapids following one another in close succession extends in length about twelve miles.

Below the Cascades the river expands into Lake St. Louis. Its shores are among the beauty spots of the St. Lawrence. After issuing from the lake we

pass the town of Lachine, nine miles from Montreal. Just below the town the steamer glides into mid-stream, that moves with increasing speed, indicative of the coming rapids, which now appear in full view. And soon we enter the last of the St. Lawrence rapids, the Lachine. A moment more and we have completed the descent and ride in tranquillity on the quiet waters below. Passing the beautifully wooded shores of Nun's Island, we see the famous Victoria Jubilee Bridge.

Sweeping beneath the great bridge, we come in full view of the City of Montreal with its busy harbor, beautiful buildings of massive stone, stately churches and cathedrals, noted colleges, famous parks, and most of all, its royal mountain, lifting its imperial head seven hundred and forty feet above the din and noise of the street.

#### DOWN THE ST LAWRENCE

Leaving Victoria Pier we first pass Longueuil, a village on the south bank. The first town of note is Sorel, at the mouth of the Richelieu River and forty-five miles from Montreal. It stands on the site of the fort built by de Tracy in 1665 and was for many years the summer residence of the governors of Canada. About five miles further down, the river expands into a vast sheet of water, twenty-five miles long and nine miles broad, known as Lake St. Peter.

Passing the mouth of the St. Francis River, we arrive at the city of Three Rivers, midway between Montreal and Quebec. Continuing the journey, we pass St. Anne and the Jacques Cartier River, after which the land on the river banks begins to rise, presenting a bold and picturesque appearance as we near Quebec, the only walled town in North America. The mouth of the Chaudiere on the south next attracts our attention, and next the great cantilever bridge, of which you see a picture on page 33. As our little boat passes beneath the bridge we wonder at its size, and marvel that men could be found great enough to think of such a structure. Before us is the grand gateway of the St. Lawrence, and on our left, crowning Cape Diamond, is the famous citadel of Quebec. This lofty fortress, which covers an enclosed area of forty acres, three hundred and sixty-five feet above the river, was built from plans

approved by the Duke of Wellington. Since the withdrawal of British troops in 1871, it has been garrisoned by Canadian soldiers. The old walls of the Upper Town still stand, but the city has spread far beyond them.

#### THE GRANDEUR OF THE SCENERY ON THE LOWER ST LAWRENCE

Leaving Quebec, we pass the Isle of Orleans on the left, and near its eastern end Mt. St. Anne raises its head twenty-seven hundred feet above the river, and a short distance below the end of the island Mount Tourmente, nearly two thousand feet in height, with its lonely lighthouse looms against the sky. We pass Capes Burnt and Rouge and a short distance further on is Cape Grebaune, which towers twenty-two hundred feet above the steamer. A few miles eastward is Murray Bay, the favorite watering place of the Lower St. Lawrence. The river here is fifteen miles broad and its waters are as salt as the ocean itself. Murray Bay, with the grand old Laurentian mountains behind and the river in front, furnishes a variety of scenery not often found in combination.

Some miles below Murray Bay the Pilgrims are seen. They consist of a remarkable group of rocks which are visible at a great distance "the mirage" seems to dwell about them. We now reach Tadousac, at the mouth of the Saguenay River. This town was the first settlement made by the French on the St. Lawrence and was their principal fur-trading post. From this point the northern shore is rough and broken while along the southern there is an almost continuous chain of fishermen's hamlets, farmhouses, villages marked by windmills, forests and green meadows, with here and there a silvery stream winding sluggishly down to the river. The St. Lawrence grows wider and wider until it has a width of eighty miles, when it is lost in the gulf of the same name.

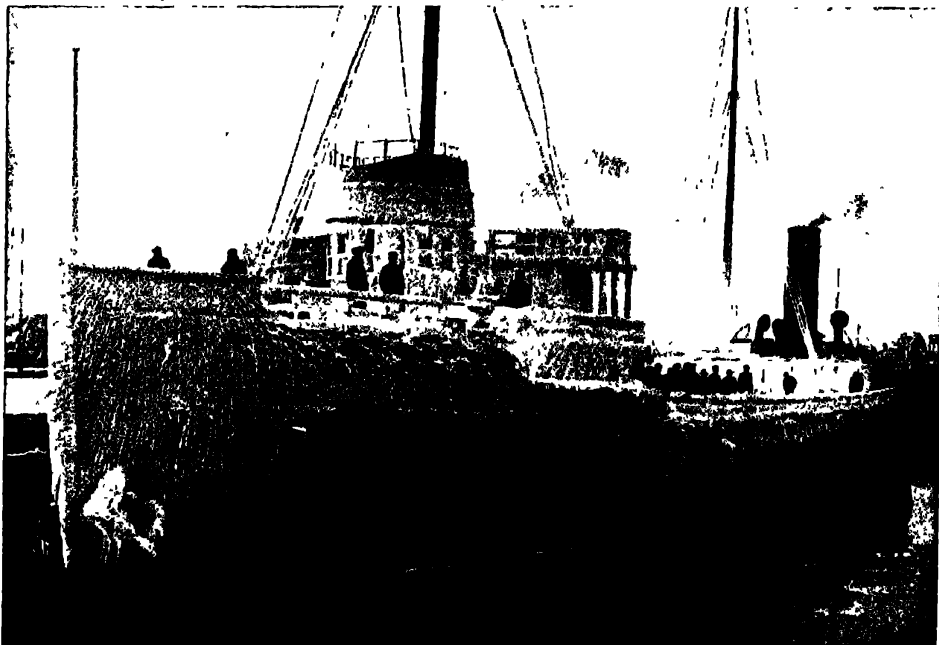
No other river can boast of such a chain of inland seas along its course, or has such a wealth of picturesque islands. Its banks have seen the conflict of races for the mastery and the struggle of nations for the possession of a continent. We may well say that in its majestic course from lake to the broad ocean, the St. Lawrence offers to the traveler more of beauty and romance than any other river in the world.

THE NEXT STORY OF CANADA IS ON PAGE 6293

## SUMMER AND WINTER ON THE LAKES



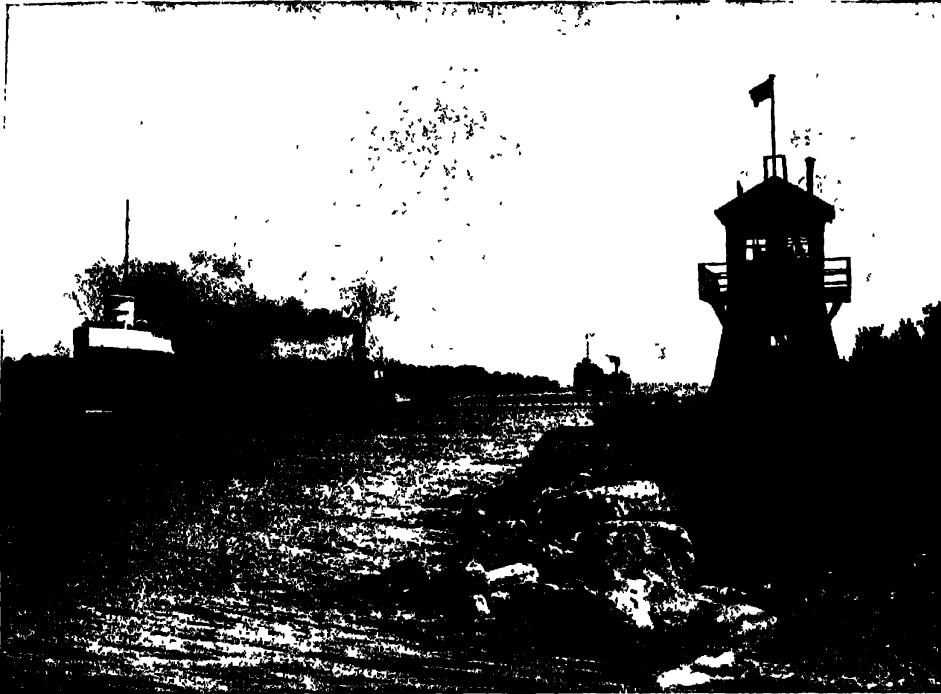
This picture shows a freight boat coming down the St. Mary's River from Lake Superior to Lake Huron, on a calm summer evening. The river is very wide and is divided by islands, one of which you can see in the picture. It is the boundary line between the United States and Canada, and some of the islands belong to the one country, and some to the other. The scenery of the river is very beautiful.



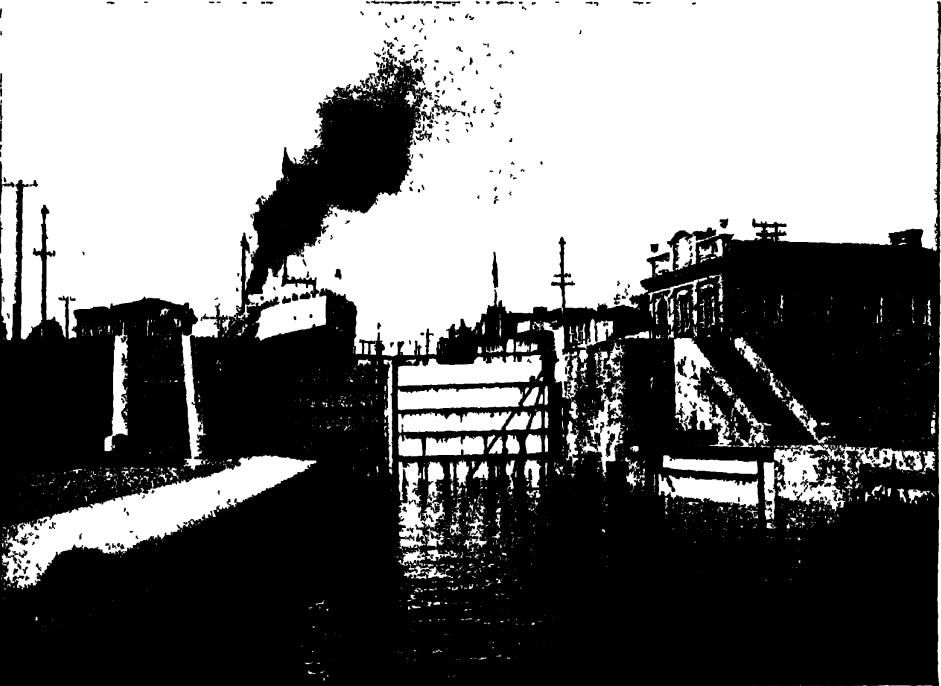
This boat has just come down the same way as the boat shown above. Dreadful storms rage on the Great Lakes in the winter season, and after about the middle of November navigation is not safe. The brave men on this boat have just brought her down from Lake Superior in December, but you can tell from her icy coating what a struggle they have had. Many boats have been lost in storms on these inland seas.



## HOW A SHIP GOES DOWN A HILL

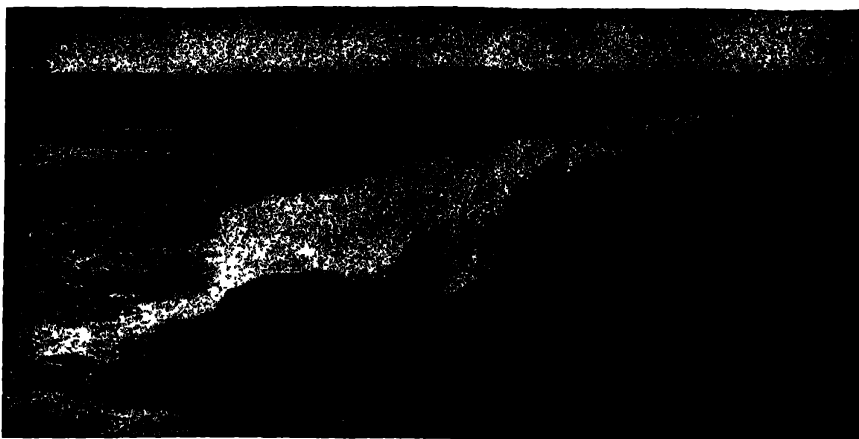


This picture gives us an idea of the freight that passes through the St. Mary's River. If the picture were large enough you could see another large boat in the distance. They hold a beautiful line as they steam through the channel, one following the other at a safe distance. This is the Michigan Channel of the river, as you may see from the coast guard station on the right. The men on duty report each boat that passes.



This picture shows a boat coming down through the Canadian canal at Sault Ste. Marie. From the position of the boat you can see that the lock is full of water. To "lock" her through, the upper gates of the lock are closed by powerful machinery; the water in the lock chamber is allowed to run off gradually until it is on a level with the water outside the lower gates; then these gates are opened and the boat goes on.

## The Book of STORIES



### THE LITTLE SPINNER AT THE WINDOW

#### WHY THE FINE SHAWLS COME FROM SHETLAND

LONG ago, far away in the Shetland Islands, there once lived a little lame girl called Grete. Her home was built on the shore of a loe, or sea lake, that ran quite a distance inland. It was built of rough stones, and had only one window.

The roof was covered with green sods, with big white daisies and other flowers growing on it; wreathed, too, with ropes of seaweed, wound round stones, to prevent the sods from being blown off in high winds. There was no garden, but the ground was covered with white sand, full of pink and white and yellow shells, for the green waves curled at its edge only a little way off.

There was a fire of peat in the middle of its only room, and as there was no chimney the smoke had to find its own way out, so the walls looked black and dismal. Then, a calf or some lambs, or even some little pigs, often shared the fireside in cold weather, and there was scarcely any furniture, for Grete and her mother were very, very poor. But they had a spinning-wheel and spun the sheep's wool into yarn, and knitted thick stockings and clothes for the fishermen.

On a sunny summer day the little island looked like fairyland, with other fairy islands shining in the distance, but Grete, who would sit at the window with her spinning-wheel and

CONTINUED FROM 6028

look out upon the island, knew it in winter storms as well, and was afraid then of the great sea which had caused her father's death, and her own lameness. For poor little Grete could not run about and join in games. Often, for days, she had to lie on her back, bearing a cruel pain that sometimes brought tears to her eyes.

One day when the sea roared, and the spray struck against the small window, dimming it so that it was impossible to see out of it, Grete, whose leg ached badly, was lying on the bed by the window.

For once the girl's busy fingers were idle, as she watched a big spider who was beginning to spin his web in the corner of the window. When she first noticed him he was running a line from one corner to the other, then he went back to the middle, and made a line fast to another corner, and after making a sort of wheel with a lot of spokes all joining in the middle, he started to work rounds. How clever he was! And he went round so fast that he made her feel quite giddy.

The spider somehow seemed to grow bigger and bigger, and his web covered more and more of the window, and was getting as white as snow. Slowly he seemed to change, until he was no longer a spider, but a trow, a queer little man with a face like a rusy,

dried-up apple. And the trow nodded his head at her, and said in a tiny voice: "Watch me, Grete, and you will know how to knit."

Yes, when she looked harder it was wool he was spinning, white and soft and fine; and the web—no, the knitting, of course, grew apace under his quick fingers. Why, it seemed quite easy to see how such beautiful patterns could be made. She was learning how to do it fast, and the little trow turned every now and then, and smiled and nodded. The door opened. So did Grete's eyes. And now there was only a real spider, with an everyday sort of web, and, it was very odd, he was no longer at work, but was

bundles, so that she might start carding and spinning it at once. It would not spin fine enough to please her the first day; no, nor the second day, but she persevered until she was satisfied; and as her wheel went whirring round, she fancied she heard the trow's voice saying: "Try again, Grete. Try again." She thought he was helping her all the time, for surely never had wool been spun of such fineness and evenness before. Then, too, the spider's web was there; and she had only to look at the window, and the pattern seemed to stand out clearly again.

Before long, the neighbors came to see the wonderful shawl that looked like lace. The fame of it even reached a great lady



A SHETLAND WOMAN KNITTING A SHAWL BY THE WAYSIDE

This picture is from a photograph by Charles Reid, Weshaw

all tucked up into a ball against the ledge because he was too disgusted at the little beads of spray that were hanging on his web to go on with making it.

"Eh, mother," Grete cried, "you have frightened away the trow just as I was getting on so grandly with learning the fine knitting."

"What has the wee wifie been dreaming about?" said her mother. "Oh, I am tired!" And she sat down, not noticing in her fatigue that Grete did not answer. The little girl could not explain just then, and felt she wanted to think it over before she forgot the wonderful pattern.

She dreamed about it all night, and next morning her mother helped her to pick out all the whitest wool from the

in Lerwick, who sent a messenger to bring it for her to see. Grete was sorry to part with her treasure, but her mother said it was a great honor for them, so it was borne away to Lerwick.

Then, one fine day, Grete saw a white sail making for the voc. Soon a lady was sitting beside her, and asking her about her work so kindly that she quite forgot to be frightened. And when the lady left she gave Grete a gold piece for the shawl, the first gold piece that had ever been seen on the island. Everybody wanted to learn how to get gold pieces, and Grete was delighted to teach them. So better days came, not only for Grete and her mother, not only for their own little island, but for all the islands near.

## THE TALE OF JENNY MARTIN

JENNY MARTIN was the daughter of a poor woodcutter in the New Forest, in the south of England. One midsummer eve she was wandering about the forest, gathering flowers, when she saw a little white mouse sleeping on some moss beneath a great oak-tree.

"Oh, what a pretty white mouse!" said Jenny. "I will take it home."

She took the mouse in her hands, and it woke up and said:

"No, Jenny, do not take me to your father's cottage, or the cat may get at me and kill me. Leave me here. I am the Queen of the Mice, and I will reward you for your kindness."

"What will you give me, then?" said Jenny.

"Anything that you like to ask for," said the little white mouse. "You have only to come to this tree and tap three times, and I will grant you what you wish."

"Well, to begin with," said Jenny, "I should like my father's cottage to be changed into a pretty farmhouse."

"That I have done," said the mouse, "as you will see when you return home."

Jenny put the little white mouse back on the moss beneath the oak-tree, and ran home. In the place of the small, shabby cottage which she had left a few hours before, there stood a pretty farmhouse with an orchard full of large fruit-trees, a stable with three horses, and a cow-shed with thirty cows; and there were plenty of ducks, geese, and chickens in the yard. Oh, how happy Jenny was, and how amazed was her father, the poor woodcutter, when he saw what had occurred!

A manly young farmer who had always been in love with Jenny came that evening to ask her to marry him. But Jenny was now proud and disdainful, and she dismissed her old sweetheart. She began to feel sorry that she had not asked the Queen of the Mice for something more than a farmhouse. So she went to the tree, tapped three times, and said:

"Little white mouse! Little white mouse! Jenny is tapping outside your house."

The little mouse peeped out and said:

"Well, what do you want now, Jenny?"

"The farm is too small and dirty," said the girl. "I should like a fine, handsomely furnished manor-house with a crowd of servants, a coffer full of gold, and a heap of rich, beautiful dresses."

"Return home," said the mouse, "and there you will find all that you desire."

Jenny thus became a rich young lady, and as she was pretty, as well as rich, the squire's son came to woo her, and all the neighbors looked forward to their marriage. But no marriage took place, for Jenny grew proud and disdainful.

"No squire's son for me!" she said. "I will get a castle and marry a lord."

So she went to the oak-tree and tapped three times, and said:

"Little white mouse! Little white mouse! Jenny is tapping outside your house."

"Dear me! Dear me! Whatever do you want now?"

"I want to be a lady," said Jenny, "and live in a great castle."

"Very well," said the little white mouse. "Go home, and you will find all that you desire."

So Jenny became a great lady, and a duke came and made a proposal of marriage to her. But Jenny was still proud and disdainful.

"A duchess?" she said. "I do not care to be a mere duchess; I must be a queen."

When she asked the little white mouse to change her castle into a royal palace, and make her a queen, the little white mouse said:

"Take care, Jenny, take care! You are getting very proud and disdainful. But go home, and, for the last time, you will there find all that you desire."

That very day the young and handsome King of England came to the New Forest to hunt.

As he was chasing the deer, he saw a magnificent palace gleaming between the trees. He rode up to look at it just as Jenny returned from her visit to the little white mouse. The woodcutter's daughter was now clad in rich, trailing robes of marvelous colours. She no longer appeared merely a pretty girl, but a very stately and beautiful lady. The king fell in love with her at first sight, and asked her to be his queen.

Jenny was at last pleased and contented with her wonderful good fortune. As she watched the preparation which was being made for her marriage with the king, she thought there was nothing left on earth for her to desire. Every day her royal lover came to her palace with

splendid gifts; she had great ladies to wait upon her, and great lords to attend to her orders, and triumphal arches connected by festoons of foliage and flowers were erected all along the road from the New Forest to the City of Westminster, where the wedding was to take place. But as Jenny was about to enter into the royal state carriage she said to the king:

"I have forgotten something. Wait a minute while I go into the forest."

The vast crowd of courtiers and knights and men-at-arms made way for her, and

become a sweeter and more dutiful girl before you get one. Go home, and profit by the lesson that is awaiting you there."

Jenny went back through the forest in a state of strange fear, for, as she looked at her dress, she saw that it had changed from a queenly raiment into the poor, plain attire of a peasant girl. The palace had disappeared, and the king and the multitude of lords and great ladies and glittering soldiers were gone. Only her father's humble cottage now stood beneath the trees, and, strange to say, when the woodcutter came home late that



THE KING FELL IN LOVE WITH JENNY AT FIRST SIGHT, AND ASKED HER TO BE HIS QUEEN

pulling up her long robe, she ran to the oak-tree, and tapped impatiently three times, and said in a commanding voice:

"Little white mouse! Little white mouse!

The Queen of England has come to your house."

"Well, Jenny Martin," said the little white mouse in a severe tone, "are you still not satisfied with all the wonderful things that I've done for you?"

"I want only one thing more," said Jenny. "When I am married I want my husband to give way to me in everything. Then I shall be ruler of England."

"You have no husband yet," said the white mouse, "and you will have to

evening to supper, he spoke as though nothing marvelous had ever occurred.

"Was it only a dream?" Jenny kept saying to herself when she found that none of the neighbors laughed at her.

No doubt the kindly little mouse made it all appear to be only a dream in order to lighten Jenny's punishment. But Jenny learned the lesson. She became a sweet, contented, industrious girl, and the manly young farmer who had always loved her came and married her, and she lived more happily with him on that quiet little farm than she would ever have done on a high and glittering throne in a palace surrounded by courtiers.

## EYES FRONT

**BOB FRASER** had a contract to supply a Coeur d'Alene silver mine in Idaho with cord wood that winter. At first, he tried living in camp and journeying out to the wooded slopes of the Sawtooth Mountains every morning, but the winter days were short and time very precious, so he built himself a log shack in the valley immediately below where he was cutting. Thence it was an easy matter for a good skier to journey every day to his work, and when he needed stores he could go into the mining village.

The snow lay deep and firmly packed on the steep slopes and Bob enjoyed his skiing in the crisp air. Each night as he finished work he wiped the blade of his axe and stuck it into the trunk of a tree ready for use the next morning. Because of the severity of the winter, game was scarce: the deer and elk had gone into lower country, and the few predatory animals of the region were very hungry--the only time when they are likely to be dangerous to man. Bob, as a good woodsman, was aware of this, but as the days passed and he saw and heard nothing he relaxed his vigilance and left his rifle in the shack.

One morning, after an invigorating climb and run, he reached the place where he had left his axe the night before. As he topped the rise he saw a furry form between him and the tree where it stuck. A mountain lion--and a big one, but lean and hungry looking. Bob gave a shout and advanced, expecting the animal would retire as soon as he saw him. But it stayed, crouching--its yellow eyes blazing--and Bob saw that it was slowly lashing its tail, sure sign that it meant to spring. He measured the distance between himself and his axe, and in the brief time that he looked away the cougar crept nearer. It became evident that he could not afford to take his eyes off those blazing yellow ones. The rifle and the shack were way down the hill, and there was no way for the woodsman to reach them but by backing in his trail. It was his one chance, however, and he determined to risk it. He slowly backed, and at his first movement the muscles on the creature's shoulders rippled, and he crept slowly after the man. Step by step and yard by yard,

the cougar creeping after him, Bob backed along the trail as it twisted and turned on its downward grade. None but an expert could have performed such a feat, and Bob had not even a ski-pole to help him. Each time before shifting his weight he tested the tenuous grip of the skis upon the trail. He dared not look behind him, he could not even look down. He tried it once, and the lion gained several feet, during the few seconds his eyes were turned away.

As he backed yard by yard nearer the cabin, through wooded hollows and over little ridges, such thoughts as he could spare from his immediate difficulties and the compelling glare of those wicked eyes, were busy with a new problem. All around his cabin the snow lay deep, ten feet and more. He had kept a clear cutting immediately round the cabin and a path through to the creek. But there was only one place where he had piled up steps against the snow wall. If he missed the steps, the cougar could spring full upon him.

When he knew that he was very close to the cabin he shot one flashing glance over his shoulder. In that time the cougar, getting anxious lest his prey escape him, by a short bound placed himself within easy leaping distance. Quickly Bob shuffled his feet out of the ski straps and then with desperate impetus flung himself down the snow slope, and fell through the door of the cabin. Immediately, he was on his feet, his back to the door to meet the heavy impact of the cougar's spring. There was a strong bolt, and exerting all his strength, he shot it, and reached for his rifle. The cougar crept around the cabin to find another entrance. Bob had guessed that he would do this, and, as the beast passed the back, he fired through the window. It was only a ten yard range and the ball struck fair between the eyes. One leap into the air, one tremor through the lithe form and the beast lay still, its days of slow starvation ended. The hide was seven feet long when Bob had stretched and cured it. It would have brought him a good price but he refused to sell it. He never went to or from his work again without his axe or his rifle on his shoulder.

## WHEN BETTY LOST HER WAY

BETTY at first thought she was still dreaming. She had cried herself to sleep among the ferns under an oak-tree, but the sound of music had awakened her.

She wiped the tears from her eyes with her pinafore, so that she could see more clearly. The moon had risen, white and large, behind the great pines in the middle of the wood, and there, in the moonshine, was a band of little gray mice, dancing and singing round the stump of a tree.

On the tree-stump stood a funny elf with a solemn face, playing music on a big fiddle, and three pretty fairies sat on the grass, watching the dancers.

Betty crept nearer and nearer, until she was able to hear that the mice were singing:

"All the corn is a golden brown  
Harvest home! Get the harvest home!  
Apple and nut are tumbling down,  
As we sing harvest home!"

"Hurry up, farmer, and cut the wheat.  
Harvest home! Get the harvest home!  
Thresh out the grain for us to eat,  
As we sing harvest home!"

"'Corn,' says the farmer, 'is my own  
consarn.'  
Harvest home! Get the harvest home!  
But the wise little mouse knows the way to  
the barn,  
As we sing harvest home!"

Then a mouse saw Betty, and gave a shriek, and away scuttled all the dancers. But the tallest of the fairies—a beautiful lady with lovely lilac wings and long, flowing lilac robes—called the mice around her, and looked sternly at the little girl.

"How dare you disturb my mice when they are holding their harvest festival!" she cried. "How is it you are not in bed, Betty, when all the world is fast asleep?"

"Please, fairy, it's my birthday," said Betty, beginning to cry. "We were having a party at the farm, and some of the children were late. Daddy went to fetch them, and I—and I—"

"Never mind, Betty," said the Fairy Queen, taking the little girl in her arms. "You shall have a special birthday party here in the woods. Play the dance to fairyland, Grimken."

Looking more solemn than ever, the elf

put his chin on the top of his big fiddle, and waved his bow three times in the air, and began to play a swift, merry dance. There was a rustle of wings, and for a moment the moon was hid by lovely fairy forms. Then down they flew to the tree-stump and clustered round their queen.

"Prepare a birthday feast for Betty of Westermain Farm!" cried the Fairy Queen. "She is five years old this very day, and has lost herself in our woods."

Away went all the fairies, and the little mice began to dance with joy. Holding each other's front paws, they circled round Betty, singing:

"Pretty little Betty is kind and sweet,  
Pretty little Betty will do no harm  
To the tiny gray mice with nimble feet  
That live with her on her father's farm."

"Do they really?" said Betty.

"Yes," replied the Fairy Queen. "But there are only thirty-two of them, so they don't take much of your father's corn."

By this time the banquet had been prepared, and a rich and glorious banquet it was—hundreds of new sorts of cakes, and puddings and tarts, and sweets of every kind. Everything was served up on gold plates, and a bright-winged fairy brought Betty a golden goblet, and poured out a delicious fairy drink for her. Rows of tables, on which was placed all manner of exquisite fruit, were set on the grass, and a band of goblins played lilting tunes during the feast.

At last the feast was over, and the dancing began. The Fairy Queen took Betty as partner, and it was wonderful how quickly the little girl learned all the steps of the wild and maddening fairy dances. Round and round they whirled on the greensward. Suddenly a cock crowed in Westermain Farm, on the northern side of the wood.

"Quick, we have not a moment to lose!" cried the Fairy Queen, touching Betty with a little wand.

Betty swayed and fell asleep in the Fairy Queen's arms. When she woke up she found herself lying, with her clothes on, in her own little bed in the farm. Her father and mother, who had been searching for her all night, still think she managed to find her own way home.

## STORIES TOLD IN INDIA 3,000 YEARS AGO

These little stories were told to the boys and girls of India a thousand years before Jesus Christ was born, but they are still as interesting as when they were originally told to the children of long ago. They were first told in Sanskrit, the sacred language of the people of India.

### THE TIGER AND THE TRAVELER

A TIGER who was too old to go hunting for his food lay hidden in the jungle, crying to the passers-by to come and receive a handsome bangle for nothing. A covetous fellow, hearing the invitation, asked to see the bangle, and the tiger pushed one of his paws a little way through the grass and showed the stripe upon it. Thereupon the covetous man started to get it, but soon found himself up to his waist in a pool of mud.

"One moment," said the tiger, "and I will come and help you out."

And, going into the pool, he seized the man and made a hearty meal of him.

*Covetousness often leads a man into trouble and disaster.*

### THE APE AND THE WEDGE

IN Behar, a great temple was being built, and a carpenter who had partly sawed through a huge beam of wood went away to dinner, leaving a wedge in the beam to prevent the two sawed parts from springing together. While the man was away, a party of monkeys came along, and one of these, thinking to appear clever before his companions, said:

"See me take the wedge out of this beam and give the carpenter more work to do!"

Then he jumped down into the opening in the beam, and tugged away at the wedge, until at last it came out, and at the same moment the sections of the beam sprang together and held the monkey fast until the carpenter returned.

*Those who make trouble for others often fall into it themselves.*

### THE BRAHMAN AND THE GOAT

A BRAHMAN who lived in the forest had been to the town to buy a goat for sacrifice, and was returning with it on his shoulders, when he was seen by three rogues, who determined to obtain his goat.

They ran ahead of him and seated themselves at the foot of three different trees.

"Why do you carry that dog, master?" said the first, with well-feigned surprise. The dog, it must be understood, is regarded as an unclean animal by the Brahmans.

"Dog!" was the indignant reply. "It is no dog at all, but a goat."

The Brahman came to the second rogue, who made the same remark. This time the Brahman took the goat from his shoulder, looked well at it, and, replacing it, proceeded on his journey.

But when still a third man said the goat was a dog, the Brahman doubted the evidence of his own eyes, threw down the animal, washed himself from the pollution of the supposed dog, and hurried off home. The three rogues then seized their prey, and cooked and ate it.

*Be on your guard against rogues.*

### THE BRAHMAN AND THE POTS

A BRAHMAN went to rest in a potter's workshop, taking with him his staff, and a little dish containing some meal that had been given to him. As he lay upon the ground he began to meditate.

"If I sell this meal," he said, "I can buy some of these pots with the proceeds. Then I can sell those and make a profit, and with the money I can buy clothes to sell. And so, in time, I shall be worth many thousands of rupees. Then I shall buy a house and marry, and if my wives quarrel I shall take up my stick—like this, and punish them—thus."

As he thought these things he waved his staff, smashed his own dish, upset the meal in the dirt and dust, and broke many of the potter's vessels. So ended his wonderful castles built in the air.

*Do not count your chickens before they are hatched.*

### THE LION AND THE CAT

AWAY in the mountains of the north of India lived a lion, who was much annoyed by a small mouse that crept out while he was asleep and gnawed his mane. At last the lion went to the village and obtained a cat, promising to treat it royally if it would keep the mouse away.

This the cat did for a time, and the lion always gave his protector the best of food. But one day, when the mouse was very hungry, it came out and was killed by the cat. The lion soon found that there was no longer any mouse to annoy him, and he at once ceased supplying the cat with food, and the cat had to return to the village and live as poorly as it had done before.

*The great are often selfish in their patronage of those who help them.*



## THE PEASANT AND THE THREE ROBBERS

A PEASANT was one day traveling to market upon his donkey, taking with him a goat that followed behind, and was attached by a rope to the saddle of the ass. As the man went along the road, three cunning robbers saw him.

"Here comes a fine fish for our net," said one. "I am going to take his goat without the simple fellow knowing it."

"And I," said another of the thieves, "will do something cleverer than that. I will take his donkey with his permission, and he shall thank me sincerely for doing so."

"Ah!" said the third robber. "I will beat you both, for I will have the very coat off his back; and while he takes it off to give to me, he shall call me his friend and benefactor."

"Come along," said all three at once.

The first robber went up quietly behind the unsuspecting peasant, removed a bell that was tied to the goat's neck, and fastened it to the donkey's tail, so that it might continue to tinkle and the poor man might think his goat was still following. The thief then loosed the rope from the goat's neck

and made off with the animal. After a time the peasant happened to look round, and was amazed to find that, though the bell still tinkled, the goat had disappeared. He ran hither and thither, but could see no trace of his goat. Just then the second robber approached, and, on being questioned, replied;

"I saw a man running in that direction with a goat, and I'll be bound to say it was yours. I will mind your donkey, if you like, while you give chase."

The peasant thanked the thief profusely and ran off, leaving his donkey with the rascal, who soon rode away upon its back.

The poor countryman, of course, found no trace of his goat, and soon returned, only to discover that his ass had

disappeared too. He was very angry with the men who had robbed him, and not less angry with himself for being duped.

"Well," said he, "the next man who tries to impose upon me will have to be very clever. I am on my guard now."

At this moment he heard a series of dismal groans, and, going to the spot whence they proceeded, he found a man weeping bitterly and sitting upon the ground near a well, in the greatest distress. It was the third robber.

"Why are you making this noise?" said the peasant. "Do you think you are the only man in trouble? I am on my way to market, and have just been robbed of both goat and donkey."

"Pooh!" replied the other. "That is nothing. I was carrying a casket of the richest jewels, and was resting by

this well, when by accident I let the treasure fall in, and there it lies at the bottom, quite out of reach."

The peasant looked into the well, but it was too dark to see anything at all.

"Why do you not dive in and recover your treasure?" said he.

"Alas!" replied the robber, groaning, "I cannot swim or dive;

but if only I could find someone who would dive in for me and get the casket, I would reward him with half its contents."

"Would you, indeed?" said the peasant. "Then I will dive in and get it for you."

The groaning man appeared delighted.

"You shall certainly have half of the jewels," he said, whereupon the peasant thanked him as the benefactor who would more than replace the loss of the goat and the ass.

Taking off his coat, the peasant dived in, but, of course, there was no treasure in the well; and when, after hunting for a long time in the water, he came out greatly disappointed, to say that he was quite unable to find the treasure, he found that the third robber had made off with his coat.



THE FIRST ROBBER TIED THE BELL TO THE TAIL

THE NEXT STORIES ARE ON PAGE 6101.

## The Book of THE UNITED STATES



A Scout is a Cheerful Companion.

### BOY SCOUTS OF AMERICA

A ROY is the most loyal being in the world. Undirected, his excess of animal spirits and sociability sometimes drive him into undesirable lines. He becomes the member of a "crowd" or "gang" and his very staunchness and unswerving loyalty to boyhood's unwritten law, that requires him to stick by a comrade even when it leads him into a row, becomes a peril to the community.

Yet this sense of clannishness and high spirits, when properly directed, becomes a firm foundation for vigor and manliness of character. The energy which often results in lawlessness, perhaps in injury to members of an opposing "club," perhaps in destruction to property, can be turned into a force which helps the neighborhood in which boys live, instead of keeping it in constant uproar.

Workers with boys have learned this fact. The day of suppression and of repression is past. Expression—wholesome, intelligent expression—is the motto of the age. If you would make men you must teach the boys to make themselves.

#### THE SONS OF DANIEL BOONE— THE FIRST STEP

Many years ago, Dan Beard, the artist, was walking down a street in

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New York City when he was struck by the fact that nine-tenths of the boys he saw did not know how to properly spin a top or to play marbles skilfully. He investigated further and found that practically none knew how to make a kite that would fly or a balloon that would ascend.

"Our boys must be taught how to use their brains and fingers," he thought, and he set out to remedy the evil by writing books to teach boys handicraft and woodcraft. Later he organized out-of-door societies under the name of "The Sons of Daniel Boone," which was later changed to the "Boy Pioneers of America," and so the germ of the Scout idea was set adrift in our country.

#### THE WOODCRAFT INDIANS COME NEXT

In the meanwhile, Ernest Thompson-Seton, author and illustrator of such well-known nature books as "Wild Animals I have Known" and "The Autobiography of a Grizzly," was working out a similar idea along independent lines. Greatly impressed by the number of "flat-chested cigarette smokers with shaky nerves and doubtful vitality" that he found among our boys, he determined to counteract this degeneracy by substituting out-of-

door clubs and athletics for tobacco and alcohol

### THE "WILD CAT BAND" OF SETON INDIANS

He began his boy work in 1898. In 1902 he had several woodcraft societies going, but it was not until 1903, when he paid a visit to a friend in New England, that his real movement was set on foot. His friend had purchased several hundred acres of abandoned land, and was turning it into a beautiful country estate. Mr. Seton found that the neighborhood boys deeply resented the intrusion of a stranger on what they considered their property and were doing all in their power to drive him out of the place. They destroyed fences, pelted sign-boards until they were tipsy, and covered the gates of the park with hideous paintings. Mr. Seton thought about the matter. He had his theories upon boy nature. With his friend's permission he gathered together a lot of tents, canoes and food, and made a camp on the shores of the little lake in the park. Then he quietly invited the boys of the near-by village to become his friend's guests for a few days' camping. They responded—at first half suspiciously and then with a turbulent outburst of animal spirits that made Mr. Seton's heart sink with inward misgiving. But he let them work off their excess of vitality, and after stuffing them with a dinner such as they had never had before, he gathered them around the camp-fire, and told them thrilling stories of heroism and bravery; ending all with the tale of Uncas, the Last of the Mohicans.

Then in the breathless pause that followed, he remarked, reflectively, "Say, fellows, how are we going to do this camping out, just tumble around any old way, or real Indian fashion?"

"Oh, Injun, bet your life!" came the enthusiastic response.

Tactfully bringing all his knowledge of boy nature to bear on the task before him, Mr. Seton led them on step by step until that very night he accomplished his purpose and the "Wild Cat Band" of Woodcraft Indians was formed. The idea worked splendidly, for the erstwhile bandits of his friend's park slowly grew into a guard of staunch supporters. Moreover they were the nucleus of many societies of boys that formed in tribes under the name of the "Seton Indians."

Mr. Seton's chief and most valuable

contribution to the scout movement consisted in the substitution of the honor idea for the competitive system, which by urging boys on beyond their strength had worked much harm in athletics.

### THE BOY SCOUTS OF GREAT BRITAIN ARE ORGANIZED

In 1904, Mr. Seton went to England to give public and private addresses upon woodcraft for boys. In 1906, he was joined in the work by Lieutenant-General Baden-Powell of the British Army. General Baden-Powell remembered how in the siege of Mafeking in the Boer War, when all the men had been needed on the firing line, the boys had been formed into little bands of messengers and had carried dispatches from fort to fort, and when the war was over had proudly received their medals with the grown-up soldiers. General Baden-Powell believed that the boys could be used successfully in times of peace as well as in war. He took Mr. Beard's Scout idea and combined it with Mr. Seton's Woodcraft Indian plan and in 1908 he set on foot the boy scout movement of Great Britain.

General Powell gathered together a handful of English boys in Surrey. He gave them a little talk, such as had been given to the boy scouts of Mafeking, he put them in uniform and drilled them a little. Then he set them to playing at Indians and Knights of King Arthur, publishing a little booklet entitled *Scouting for Boys*. The idea spread until now in Great Britain boy scouts can be seen everywhere—"in the slums of East London, in the loneliest country parishes, in towns and hamlets from Land's End to John O'Groat's."

### THE IDEA OF SERVICE HELD UP TO THE SCOUT

"Whenever anything happens—when there is a railway accident, a horse runs away, a house catches fire, or a man falls in the river, boy scouts seem to appear on the scene as if by magic, to make themselves useful in any and every way. How useful it may be to have on hand a trained and disciplined force of quick, intelligent boys in every emergency was seen at the time of a terrible railway accident on the London to Brighton railway. The local scouts, who were playing football, when they heard of the accident, rushed to the scene with their ambulance stretcher and for many hours calmly and promptly performed noble and terrible

## BOY SCOUTS ON THE ROAD AND IN CAMP



This picture shows a troop of Boy Scouts on a hike to its camping grounds with tent and supplies in the trek cart. The other scouts on bicycles and on foot bring up the rear. Such a troop consists of twenty-four to thirty-two scouts, divided into three or four patrols of eight scouts each, each having its own leader, and the whole troop being under an adult scoutmaster with one or two assistants over eighteen years old.



This picture shows a kitchen squad at a scout camp and rally. Each first-class scout is able to prepare a meal in a manner that is often of great assistance to Mother. There is one troop that can break ground at a new camping place and have tents up and fire built and everything in order, and can produce a pan of smoking popovers, within twenty-eight minutes of the arrival of the troop on the camping ground.

duties of rescue among the killed and wounded, giving most valuable help to doctors, public and railway servants."

It is this idea of service—of doing something for somebody every day—which was added to the scout idea by General Baden-Powell, and which immediately brought the movement to the attention of boy workers and has done so much to give it wide popularity.

### THE BOY SCOUTS OF AMERICA

In America the Scout movement was not legally incorporated until February 8, 1910. Since then it has progressed rapidly until now there are hundreds of thousands of boy scouts in the United States, with many thousand leaders of troops called Scout Masters. Bands of boy scouts can be found in every state in the Union, in Panama, in Cuba, in Hawaii, in the Philippines. The movement swept over the country with an enthusiasm and impetus even greater than in England. In fact, as General Baden-Powell stated at a dinner given him at the Waldorf Astoria, the vast stretches of territory, woods and streams—ideal camping grounds—give the movement a greater future in America than even England can ever hope for. Yet, wherever the movement spreads, it is "the magician's wand that turns boys into upright, honorable, chivalrous, kindly, self-reliant, useful and patriotic men."

These words were spoken several years ago, and since that time, the boy scouts have proved again and again what fine work well-organized, disciplined bands of boys can do. They have not in this country been called upon to patrol roads and guard bridges, as they have in England, but they have done other things of equal value. Their work, for instance, in promoting the Liberty Loans has been almost beyond praise. They have been instrumental in gaining very large sums in subscriptions for the loan. The modest, manly bearing of the boys who did the work, and their eagerness to give their playtime to patriotic service, showed the value of their scout training.

In the summer of 1916, when it was seen that large supplies of food were needed in Europe, many boy scouts devoted a large part of their vacation to gardening, to picking berries and other fruit, and in other ways aided in the production and preservation of food.

### THE SCOUT LAW, WHICH EVERY ONE MUST KNOW

On the Scout Law, which every boy must know by heart before he can become even a tenderfoot—the lowest grade of scout—hangs the whole glory of the scout idea.

The Scout Law in its present form says:

#### 1. A Scout is trustworthy.

A scout's honor is to be trusted. If he were to violate his honor by telling a lie, or by cheating, or by not doing exactly a given task, when trusted on his honor, he may be directed to hand over his scout badge.

#### 2. A Scout is loyal.

He is loyal to all to whom loyalty is due: his scout leader, his home, and parents and country.

#### 3. A Scout is helpful.

He must be prepared at any time to save life, help injured persons, and share the home duties. He must do at least one good turn to somebody every day.

#### 4. A Scout is friendly.

He is a friend to all and a brother to every other scout.

#### 5. A Scout is courteous.

He is polite to all, especially to women, children, old people and the weak and helpless. He must not take pay for being helpful or courteous.

#### 6. A Scout is kind.

He is a friend to animals. He will not kill nor hurt any living creature needlessly, but will strive to save and protect all harmless life.

#### 7. A Scout is obedient.

He obeys his parents, scout master, patrol leader, and all other duly constituted authorities.

#### 8. A Scout is cheerful.

He smiles whenever he can. His obedience to orders is prompt and cheery. He never shirks nor grumbles at hardships.

#### 9. A Scout is thrifty.

He does not wantonly destroy property. He works faithfully, wastes nothing, and makes the best use of his opportunities. He saves his money so that he may pay his own way, be generous to

## MAKING AND BREAKING CAMP



The three hundred thousand and more members of the Boy Scouts of America try each year to have a few weeks of life outdoors, where they learn many practical things—such as first aid and life saving, cooking, swimming, a knowledge of animals and trees and flowers and the stars, and, best of all, the spirit of self-reliance. Here we see the scouts ready to make camp, and doing quick work on their tents.



In this picture the scouts are striking their tent after a camp at their summer farm. Scouting teaches boys the value of team work, and does not permit of shirking. Each scout must pass certain tests in practical knowledge and be ready at all times to do his part in the application of it. The boys in camp are taught to guard their health carefully, and the scout camp is always marked by careful scouting arrangements.

those in need, and helpful to worthy objects.

He may work for pay, but must not receive tips for courtesies or good turns.

10. A Scout is brave.

He has the courage to face danger in spite of fear, and to stand up for the right against the coaxings of friends or the jeers or threats of enemies, and defeat does not down him.

11. A Scout is clean.

He keeps clean in body and thought, stands for clean speech, clean sport, clean habits, and travels with a clean crowd.

12. A Scout is reverent.

He is reverent toward God. He is faithful in his religious duties, and respects the convictions of others in matters of custom and religion.

### THE SCOUT OATH PROMISES DUTY TO GOD AND COUNTRY

Before he becomes a scout a boy must promise:

On my honor I will do my best—

1. To do my duty to God and my country, and to obey the scout law;
2. To help other people at all times;
3. To keep myself physically strong, mentally awake, and morally straight

And he raises his right hand level with his shoulder, palm to the front, thumb resting on the nail of the little finger and the other three fingers pointing upward, to make the Scout Salute.

Before he became a tenderfoot he was taught the meaning of the scout oath, how to make sailors' knots, and learned the composition of the national flag and the right way to fly it. Once he has passed his test as a tenderfoot and has assumed the picturesque uniform for which his boy heart has been yearning, there are other interesting duties into which he is initiated. He learns first to give aid to the injured, to signal by means of the Morse alphabet or semaphore; to run half a mile in twelve minutes at scout's pace; to use properly knife or hatchet; to lay and light a fire in the open with not more than two matches; to cook a quarter of a pound of meat and two potatoes without cooking utensils; earn and deposit at least one dollar in a public bank; and to know the sixteen points of the compass. Furthermore to

qualify as a second-class scout he must be able to track half a mile in twenty-five minutes or to describe the contents of a store window from memory. Before he can become a first-class scout there are other heights of scoutcraft to climb, all full of fascination to an active, healthy-minded boy.

And so the boys, bit by bit, learn endurance, self-reliance and self-control; they learn the secrets of the woods and fields and become possessed with an earnest, manly desire to be of service to some fellow human being every day. They are given a purpose in life.

### AIM OF THE MOVEMENT—TO MAKE MANLY, USEFUL CITIZENS

The Boy Scout movement is not a military organization in any sense of the word—neither is it a church movement. "A scout's religion is his own private business," Mr. Beard said in an interview which he very kindly granted to the writer of this article, "and it is not questioned by his officers or fellow scouts. The aim of the movement is to make honorable, useful, manly American citizens, and to do this without opposition of parents. All debatable ground is carefully avoided." And doing this, have we not laid the firmest foundation for the best and highest in any religion?

### THE YOUNG KNIGHT OF THE TWENTIETH CENTURY

As Mr. Blumenfeld so truly says: "All you have to do is to collect, say, a dozen boys, ragamuffins, young ruffians, boys of blue blood and boys of red blood, anything so long as it is a boy, teach him the Scout Law, put him on his honor, stick him into a uniform, and you have at once transformed the urchin into a blazing-eyed young knight errant, a chivalrous, honest, honorable, and zealous patriot." And yet there are people who disapprove of the Boy Scout movement!

As an antidote for idleness and for that aimless activity which so often goes wrong when misdirected, or undirected, the Boy Scout movement is supreme. It furnishes not only wholesome occupations in the outdoor life, but gives the boy fine, high and true things to think about, at the age when he is most easily influenced for good or evil—a benefit which cannot be measured because it is an endless chain, whose first link connects with the family life in the home.

THE NEXT STORY OF THE UNITED STATES IS ON PAGE 6271.

## SCOUTS AT WORK AND AT PLAY



The scout games, as well as the scout tests and purposes and spirit, are the same among the millions of scouts in every country. Here we see the boys making a scout pyramid, which is of practical use in wall scaling and for signaling. "A scout is a brother to every other scout," the world over. This great organization of the "boy-power" of the world has become a mighty power for good among the nations.



The Boy Scouts of America have been of great assistance in food growing and saving since the Great War of Nations began. At the request of the food administrator, Mr. Herbert Hoover, thousands of scouts raised war gardens. Hundreds of scouts have worked on farms and helped to harvest crops, as shown in the picture. The Government gave medals to scouts who had their own gardens, and interested others.



## ON THE SEASHORE AND IN THE WOODS



Here we see a scoutmaster instructing his troop in coast patrol work. There are seventy-five thousand scouts living near the coast who are ready whenever the Navy Department may call them. In England the Boy Scouts have been of great assistance in watching the coast line. The scouts in America are skilled in signaling, and the patrol organization has been perfected, and can be used by the Government if necessary.



Here we see the scouts preparing a meal in the open field. The boy in the background looks envious. But scouting is not all play, as is shown by the work of this greatest organization in the world for boys, in helping the government in the sale of Liberty Bonds and War Savings Stamps, and as "dispatch bearers," and in many other ways, such as helping other organizations like the Red Cross and the Y. M. C. A.

# The Book of GOLDEN DEEDS

## WHAT THIS STORY TELLS US

THE stories of the missionaries to the American Indians in the early days are full of examples of bravery, particularly in Canada. The Indians of the colonies to the South did not seem to be so fierce. In another place you may read of some of them. After a long time the Indians learned the power of the white man, and ceased to torture the men who brought them the story of Christianity. The good priest whose story is told below was not so much in danger of his life or of physical torture, but he gave his life to his people, and endured all manner of hardships, in looking after his people. This is a story of heroism shown day by day in doing unpleasant things.

## BLACK ROBE AND WHITE HEART

ON New Year's eve, 1839, Albert Lacombe, al-

most twelve, stood at midnight in the raftered kitchen of his house near St. Sulpice, Quebec. Very proud and very happy was he, for he was to repeat to his father the New Year's wishes that his mother had taught him. This is one of the pretty "habitant" customs that has not died out in French-Canadian homes.

The night air was so frosty and still, that the joyful chimes from the cathedral in Montreal, twenty miles away, blended with the peals from the gray-towered church around which the little parish of St. Sulpice clustered.

The lad's heart was filled with something like awe as he listened and waited for the music of the bells to die away. He noted that the vivid blaze from the wide fireplace, heaped with logs, flamed brightest on his brothers and sisters as they knelt about their father's knee. His mother stood in the deep shadows of the low room; she was thinking, he believed, of her ancestress who many years before had been captured by an Ojibway chief and was rescued by her "voyageur" uncle, who had brought her and her half-breed children back to her childhood's home.

As the chimes rang out the little formal speech was given, and closed

*Continued from 5950*



with a request for their father's blessing, but to Albert's boyish loyalty, his mother seemed left out. Turning to her, he cried impetuously, "And, Ma-man, you know how we love you!"

This unpremeditated outburst gives us the keynote of Father Lacombe's whole life. He traveled thousands of miles over the great high plains of the Canadian Northwest, over oceans and foreign countries, and always his cry was, to those who were within reach of his voice or influence, were they Indians, metis (half-breed), or white men, "And you know how I love you!"

Albert and his brothers and sisters lived with their father and mother on the farm in St. Sulpice. The boy, when not at school, was kept closely at work on the farm. He enjoyed making sugar when "sugaring off time" followed the snowy winters in Quebec, but picking up stones on new land, feeding pigs, driving a plough,—these were duties not so pleasant, and his thoughts were busy with plans for the future. Should he be a "voyageur" like his grand-uncle, Joseph Lacombe, and go to the far, far West, where the fur companies sent men who were brave? His parents were so poor, that he could not hope for their assistance in gaining an education.

One day a wonderful thing happened. The curé, driving a fat old horse, came to make a call. He spoke of the weather, and of the crops. Suddenly he turned to the shy lad standing near. "My little Indian," he said, for he was fond of Albert, and knew the story of Madame Lacombe's ancestress, "what are you going to do?" Albert was speechless. He knew what he wanted; but how could he tell so grand a man as "Monsieur le Curé?" He looked up desperately at his father. So the kindly father explained that he could not afford to send his eldest child to school, although the boy longed for books and knowledge. The curé nodded, but made no further reference to his question until he was leaving. Then he called back, as he clambered into his old cariole, "You send him to college and I will pay his way. Who knows? Some day our 'little Indian' may be a priest for the Indians."

So for years Albert Lacombe studied. He enjoyed his school, enjoyed his college. But like all real missionaries born, he grew to feel that school life and indoor life were not for him, and when he was twenty-two, he started for the far country he had dreamed of ten years before. Travel was not easy then. His long cassock was often ridiculed, and the long trail from Montreal to Pembina, far out on the northwestern prairies as distances were then reckoned, seemed very long indeed, as it was covered by stage and steamer from Montreal to Buffalo, from Buffalo to Dubuque, Iowa, and from there to St. Paul, Minnesota. On the Mississippi steamer the first free air of the wilderness came to young Lacombe. "I began to breathe freely, at last," he says of those delightful days. "I felt myself a new man."

When he reached St. Paul, the scattered settlement of log houses that had but recently dropped the name of Pig's Eye, he found scant accommodations. His horror at being shown a coffin in which to sleep was genuine, but "It's much better than the floor," the frontier priest remarked. "We made it too short for one of my parishioners; but even so, it serves a good purpose."

From St. Paul on, the trail was harder and lonelier. The oxen drawing the creaking wooden carts moved slowly along the muddy roads. The marshes and creeks were swollen by the recent

rains, and sometimes the carts and oxen sank so deep in a swamp that the whole party had to work in harness to drag them out. Pembina was reached at last and there began Father Lacombe's years of service to the Indians and metis. He learned many Indian languages, went with the Indians on their annual buffalo hunts, when the unnumbered bison roaming the prairies looked like the type on this page, so closely did they feed, taught the children, baptized all who would, worked and loved. That was the Golden Age for the Indians, for the bison supplied them with three great necessities of life, food and clothing and fuel, and they were brave and independent and free.

Finally the missionary was sent further west. From St. Boniface and Fort Garry to Edmonton House, then the most important trading post of the Hudson's Bay Company west of Fort Garry, he traveled by way of Cumberland House. From there, ten York boats conveyed the party up the Saskatchewan. Alas, Father Lacombe's dreams of the free life of the "voyageur" were not borne out by the reality of their tasks. Canoes had been done away with, and men hauled the heavy boats against the current as horses hauled the boats on the Erie Canal. Walking in mud, over rocks, through swamps, along cliffs, sometimes in water up to their arm-pits,—small wonder the men were glad when they neared Edmonton House. Then they donned fresh red woolen shirts and knotted kerchiefs around their heads to make a brave appearance as they climbed the green banks of Saskatchewan to the palisade-hid fort, trading post, storehouses and the deep roof of "Rowand's Foli," as the governor's house was called. The flag-pole even was invisible; but the red flag bearing the well-known H. B. C. shook in vehement welcome as the western breeze blew over the ravine.

When the Blackfeet, Blood, Piegan, Strongwood and Plains Crees came to trade in spring and autumn at Edmonton House, Father Lacombe welcomed their coming as another opportunity to get acquainted with more Indians. He watched with interest as the men rode up, wearing skin shields on their arms, full quivers at their sides, eagle-feathers in their hair, and startlingly bright paint on their supple, half-naked bodies.

Squaws and children, yelping dogs and clanging iron kettles added color and noise as they followed the ponies that drew the travois, or Indian wagon, formed of crossed poles on which were piled the camp equipment.

While the men traded their furs and skins for the things they wanted, the squaws put up the lodges and made the camp. Soon every Indian, big or little, knew and loved Father Lacombe.

On and still further on he traveled. He went to Peace River, Little Slave and Lesser Slave Lakes. He went to Jasper House, where Father De Smet, who brought the story of the cross to the Flat-head Indians in Montana in 1840, had gone in 1845-6 as peacemaker. It is at this place where the Athabasca River pours out from the Rocky Mountains, heading deep within their mighty gorges and ravines. Sometimes he was in forest fires, in floods, in blizzards. He wandered on foot, by boat, by pony or dog-team, even on snow-shoes, and everywhere he went he was cheerful, sunny and hopeful.

When smallpox and scarlet fever came among the Indians, there too was Father Lacombe, with medicine and advice, no matter how far away he might have been at the time of the outbreak. When a tribe of Crees attacked a tribe of Blackfeet with whom he was camping, he went around the outside of the palisade, holding his crucifix aloft and waving a red and white flag in an appeal for peace. In the noise of the battle the Crees did not hear him and a low-lying fog shut him out of their vision. He called to the unseen enemy, he waved his flag, but his efforts were unavailing. Suddenly a bullet, which had already touched the earth, rebounded to his shoulder and, glancing off, struck his forehead. The wound was slight, but the shock was so great that he staggered and fell. The Blackfeet, angered afresh, set up a wild shout, "You have wounded your Blackrobe, Dogs! Have you not done enough?" When the startling word ran through the ranks of the Crees, the firing ceased, and without waiting to meet their friend, the Man-of-the-Good-Heart, the Crees withdrew in confusion.

And so the years went on. The Northwest Mounted Police took charge of the country west of Winnipeg. The settlers came. Cattle, horses, and wheat fields increased. Railroads crossed the country

the missionary had so often traversed. The fur trade diminished, and the buffalo vanished. The metis and Indians, who tried farming with poor success, were starving. Meanwhile towns multiplied. Father Lacombe's Indians sorely needed his love and aid. He had known them brave and powerful, honorable and hospitable—now they were degraded dependents. Where had the wilderness gone?

There are but few places in Canada, England, and even on the Continent, to which Father Lacombe did not go to gather money and get grants of land for his poor Indians and metis. Queens, diplomats, emperors, even the Pope himself, were interviewed, and never without instant response. His good works are so well known that one time at a banquet a toast was given in which he was compared to a carriage that, long ago, used to wend its way from one end of Rome to the other, and in which any one who was in trouble might take refuge, whether they were innocent or guilty. The toast concluded with the words, "He lends himself to all, for all."

As the years slipped by Father Lacombe finally settled down, at eighty-six, in a "Home," near Calgary which he had founded for the homeless children and homeless poor who might be stranded as the tidal wave of immigration swept over the plains he loved so well. His Indian friends were practically all dead. Yet his great heart had to find some one to father, some one who needed him, some one to love.

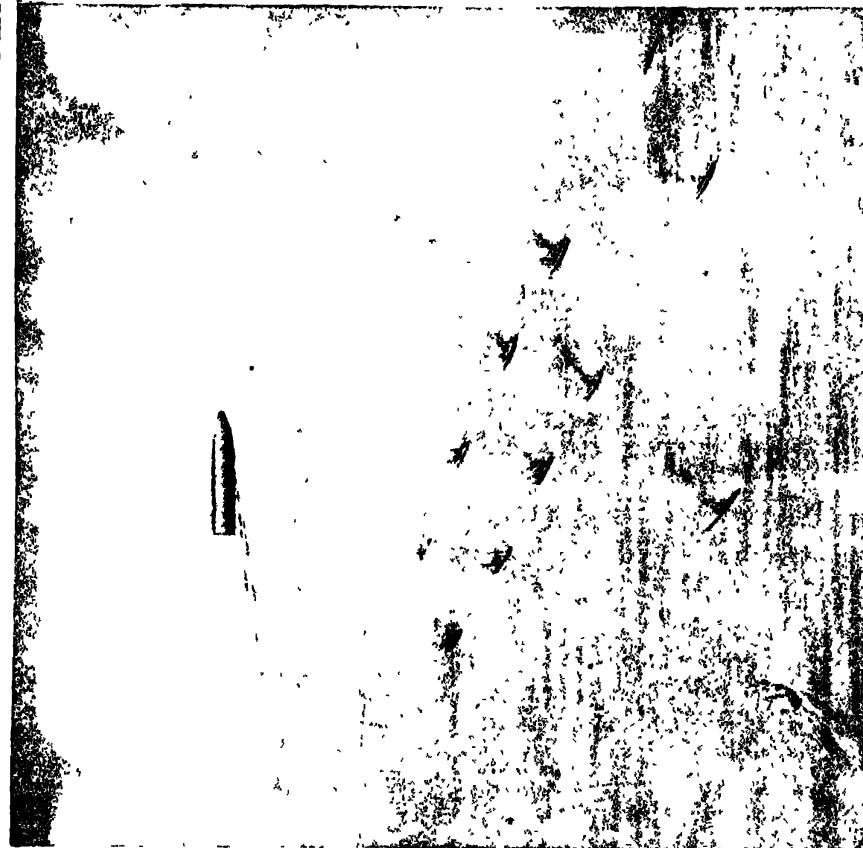
Shrunk and stooped, quieter than in the stirring years of wandering, yet with eyes and heart aflame to want and misery as of old, Father Lacombe's own words may well end his story.

"We are told that in the earlier days of the Church an old white-haired man, bent with age and particularly tried by the labors of a long, painful apostolate, being no longer able to walk by himself, was carried by his disciples into the midst of an assemblage of the faithful, where he did not cease to repeat: 'Little children, love one another.'"

"This old man was the apostle St. John. *Eh, bien*, to-day you have before you another old man. I will say to you nothing else than what St. John said; like him I shall repeat to you, 'Love one another.'"

The good Blackrobe died soon after.

# HALF A TON OF FIRE AND STEEL FLYING FROM ENGLAND TO FRANCE



A GUN FIRED AT DOVER WOULD HURL A HALF-TON SHELL TWENTY MILES ACROSS THE CHANNEL AND DESTROY A TOWER IN CALAIS. The mighty power of the modern gun seems like some wild nightmare. The weapons with which our latest warships are armed could hurl a mass of steel and explosives weighing half a ton from Dover to Calais in a few minutes, and at the end of its journey the shell would strike with great force and explode, doing immense damage.

# The Book of FAMILIAR THINGS



## WHAT A BIG GUN CAN DO

THE MOST POWERFUL THING ON EARTH

**T**HE most powerful thing on the earth made by the hands of man is a big gun. With this mighty weapon he can send over a ton of metal flying through space at a speed of over twenty miles a minute, hitting a ship with force enough to shatter it to pieces.

It is a terrible thing to think that this great power is meant for the destruction of life, that the utmost strength that men can put into a thing is put into it to wreck ships or to blow up cities. But the guns are made for use in war and, while war remains possible on the earth, nations prepare for what may happen. The United States and Great Britain, with vast territories and wide seas to guard, put themselves in such positions that other powers will not wish to attack. That is the meaning of all the mighty Dreadnoughts and of the new 14, 15 and 16 inch guns, with which the big ships and the forts on land have been armed.

### **T**HE MOST POWERFUL GUNS NOW ON SHIPS

The British Navy is the most powerful fighting machine ever set up on the face of the earth, and it is powerful because of its mighty guns. The most powerful gun in the British

CONTINUED FROM 0059

Navy, the most powerful gun known to be afloat, is known as the 15 inch. There may be some 15 inch guns on German war-ships, but of this we are not quite certain. That is how we speak of the power of a gun; fifteen inches is the width across the diameter of the muzzle, the point at which the shell leaves the gun. In the United States Navy at present there are no guns larger than fourteen inches. The largest ships carry twelve of these instead of eight of the larger size.

What does a 15 inch gun mean? It represents the power to send a shell right through more than twelve inches of the hardest steel at a distance of seven miles. It can do very much more than that. It might send a shell from the top of Dover cliffs right over to the coast of France. But we are dealing now with the definite purpose of a gun. It is of no use firing great shells at random; each one costs hundreds of dollars to fire. To be sure of hitting, the gunners must have sight of at least the masts of the vessel at which they aim. From eight to ten miles is the greatest distance at which a gunner at sea can be expected to do good work.

Let us suppose, then, that the un-

fortunate day has come when one of these great guns has to be fired, as it has indeed in Europe. Let us describe what actually happened in such a case during the Great War, when the British and German ships fought off the Falkland Islands, in the South Atlantic.

#### HOW A BIG GUN ON A BATTLESHIP IS FIRED

The ship lies eight or nine miles from the enemy's ship. With his instruments, an officer calculates the distance, and the gun is aimed according to directions given the gun crew. Finally the word to fire is given. The gunner presses a button, a current of electricity is set up, a charge of powder is exploded and, with a deafening roar, the cannon throws out a great shell which speeds through the air.

This half-ton shell, shaped like an immense cigar, whirls through the air, and, in a little more than the time that it takes a fast runner to run a hundred yards, covers the eight miles separating it from the enemy's ship. Its journey is ended, but its work is only now begun. The shell, though it has been flung nine miles, has still enormous power behind it. It may go through the steel armor of the ship and burst into fragments, making an enormous hole in the side of the ship, perhaps entirely ruining it, rendering it a helpless wreck. If that one shell should not do the deadly work, others will follow.

#### SOME LAND GUNS GREATER THAN NAVAL GUNS

Yet huge as is the naval gun, it is smaller than some of the big guns used on land in the present war. When the Belgians began defending Antwerp against the Germans they expected to be able to hold out at least three months, but in eleven days the massive, concrete and stone fortifications about the city were reduced to powdered heaps by the shells of the German cannon and the city had to surrender.

These great siege guns did not have long barrels such as those on the battleships, but were shorter. They were not fired directly at the object to be destroyed, but were fired at an angle, so that the shells described a half circle and fell upon the forts.

#### THE GREAT GUNS USED IN THE EUROPEAN WAR

The Germans had brought up a 16.5 inch gun, which hurls a shell weighing

a whole ton. Never had such a powerful weapon been used in warfare. The gun itself costs half a million dollars and, with its carriage, weighs 120 tons. Three quarters of a ton of powder is required to fire each shot. When the massive shell from this gun fell on the fortifications of Antwerp it would explode and send a fountain of shattered concrete and stones a thousand feet up into the air, leaving a hole like the crater of a volcano. It is no wonder that the Belgians were unable to hold the city longer. Most of the guns the Germans used were smaller, either eleven or twelve inch, but these were also very powerful. Small shells were dropped in Paris from a point seventy-two miles away.

#### THE MOST POWERFUL GUNS EVER BUILT

There is, however, a gun even more powerful than "Big Bertha," as the Germans call their biggest gun, after the daughter of the great gun manufacturer. That is the 16 inch gun which the United States has mounted at Sandy Hook, outside New York, to defend the harbor against possible attack. Though it is half an inch smaller than the German gun, it is a real gun, fifty feet long. It fires a shell considerably heavier, weighing 2,370 pounds, and requires 667 pounds of powder.

Two more guns exactly like this one have been made for the fortifications at the Panama Canal. These monsters could sink a battleship long before even its masts would come into sight of the gunners. To accomplish that purpose an officer would go up in an aeroplane, locate the enemy's ship, then signal to the gunner where to aim. Or a tower is built from the top of which an officer could get the position of the ship. The gunner would then aim with his directions as guide. But a tower is not so good as an aeroplane, as it reveals the location of the gun to the enemy. This gun, of course, cannot be moved from place to place, but is fastened securely to a foundation of concrete and steel.

#### THE GREAT GUNS WHICH GUARD THE PANAMA CANAL

To fire one of these biggest of big guns it must be raised at an angle to fire twenty miles. That is why a ship has never carried so powerful a gun; the recoil from the shot downward would be so great that the deck might not stand the

strain. The United States is experimenting with a 16 inch naval gun, however.

The making of one of these great guns is a triumph of engineering skill. Though a cannon looks solid, it is not made in one piece. The barrel is bored out from solid steel of special purity, and its interior is scored, or "rifled," to make the shell twist as it flies through the air. Then outer tubes, or coats, of metal are "sweated on." That is to say, they are heated, which causes them to expand, and then are fitted over the inner part and allowed to cool and shrink.

#### HOW TINY WIRE STRENGTHENS THE GREAT GUNS

The makers may go on building up outer coats of metal in the form of joined steel hoops, or they may wind wire on a gun. The wire, wound by machinery, is coiled round and round, till more than a hundred miles of it has been wrapped around the great cannon. Great as is the strength of the wire in resisting pressure which pushes out at the sides, it does not give strength lengthwise. Extra thickness of metal must, therefore, be given at the muzzle of the gun, where the vibration caused by the shell leaving the weapon is heaviest.

The back of the gun is the breech. It is here that the shell is placed, in a specially constructed chamber. When the shell has been fixed in position for firing, the breech is closed and fastened by enormously strong screws, so that the charge shall not burst the gun open at the back. When all is ready, and the word to fire is given, an electric spark is kindled and this fires the charge which sends the shell forth on its terrible work.

#### THE DIFFERENT EXPLOSIVES USED TO DRIVE THE SHELLS

The explosives used in big cannon are of many kinds. Some, as those used in quarrying, are intended simply to rip and tear and break. Others are intended to drive things forward. Those which change to a gas immediately, of course exercise greater power for a minute. They would probably burst a gun, but are used in shells which burst outside. An explosive which changes to a gas more slowly is used to force the shell out. The shell itself contains a quickly burning explosive which bursts the shell later.

And this brings us to the whole mystery of the flight of the shell. When the charge is exploded, either by heat

or shock, the effect is the same. Gunpowder, of course, is a powder, but cordite is not. It looks more like a kind of cord, and it is that fact which gives it its name. There are many other high explosives with different names. But the effect is the same in all cases. The electric spark, or other form of heat or shock, explodes the charge. In an instant the mass of the explosive which discharges the shell is converted into boundlessly expanding gas.

#### THE EXPLOSIVE IS CHANGED TO GAS, WHICH NEEDS MORE ROOM

Gas takes up a great deal of room. The gas cannot get space in the cannon, because the huge shell is in the way. As nothing can stop the gas from expanding, in its gigantic effort to free itself, the great shell is sent spinning to the muzzle of the cannon, and out for twenty miles into space. A shell weighing a ton can be driven from England to France in a minute or two.

An explosion of gas in a house will blow all the windows out and perhaps shatter a door or two and bring down a wall. But imagine that explosion enormously multiplied, *occurring within a tiny steel chamber!* We can fancy how things would fly then. That is what happens in the terrible recesses of the mighty gun. The explosive, changed into enormously powerful gas, must instantly find its way out. There is only one way out, and that is up the tube of the cannon to the open muzzle. The shell is in the way, and the shell must go.

Explosives such as cordite, or smokeless powder under different names, are used in preference to gunpowder. Since they are smokeless they do not betray the gun to the enemy. They explode more gradually and do not exhaust themselves so quickly. To fire a big shell would require such an enormous quantity of gunpowder and it would explode so quickly that it would probably burst the whole gun before the shell reached the muzzle. Aside from that, cordite, since it explodes more gradually, does not heat the sides of the cannon so much. Cordite, however, creates such intense heat that it melts a little of the inner surface at each shot and the very big guns can only fire a limited number of shots. After that a new lining must be put in.

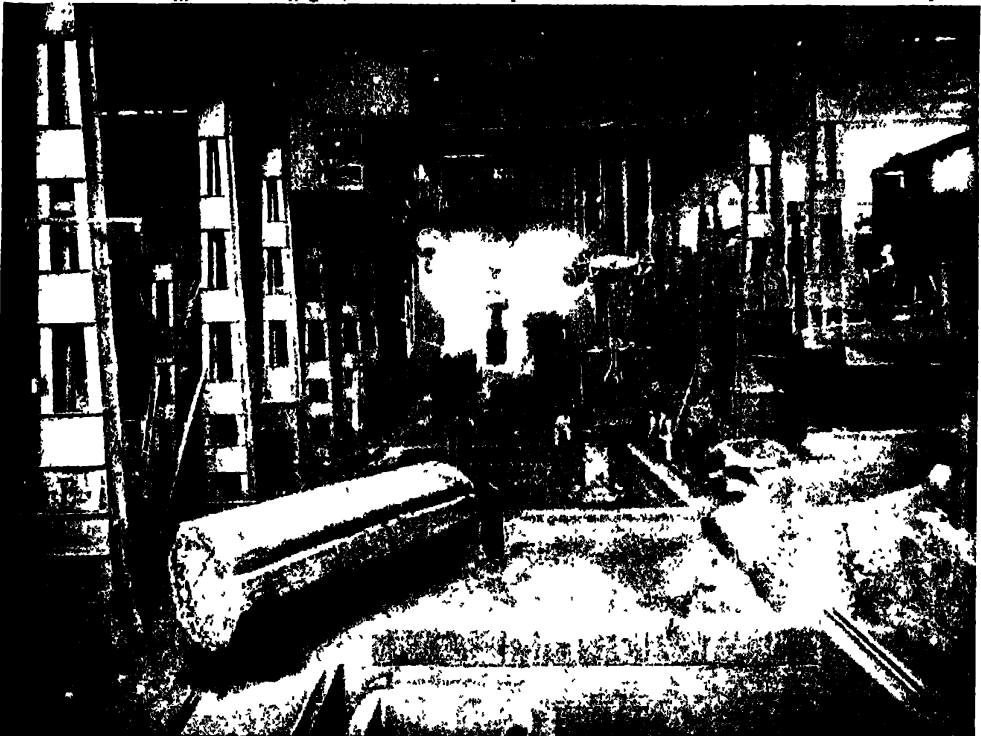
THE NEXT STORY OF FAMILIAR THINGS IS ON PAGE 6197.



## THE BIRTHPLACE OF A MIGHTY GUN

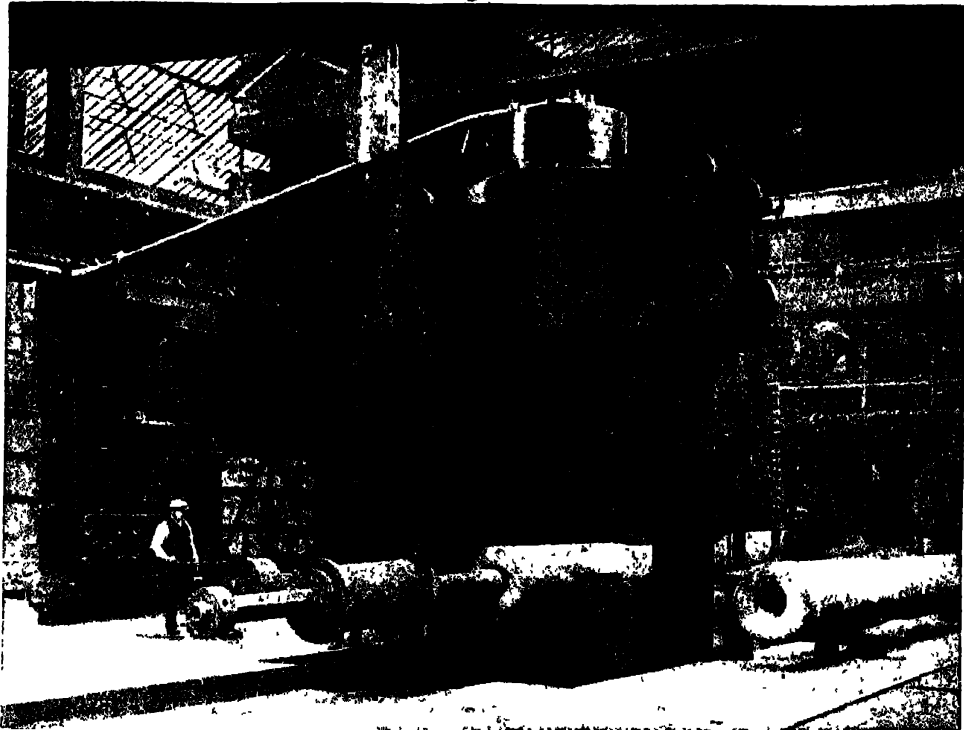


Of all the wonderful inventions conceived by man, perhaps none can so truly be regarded as a symbol of might and energy as the big gun, of which these powerful steel furnaces are the actual birthplace



The steel is drawn from the furnace in a fiery stream, and carried in a great ladle to the casting-pits, as shown here. When it cools it becomes a solid ingot of fifty tons, like that seen on the left.

## HAMMERING THE JACKET INTO SHAPE

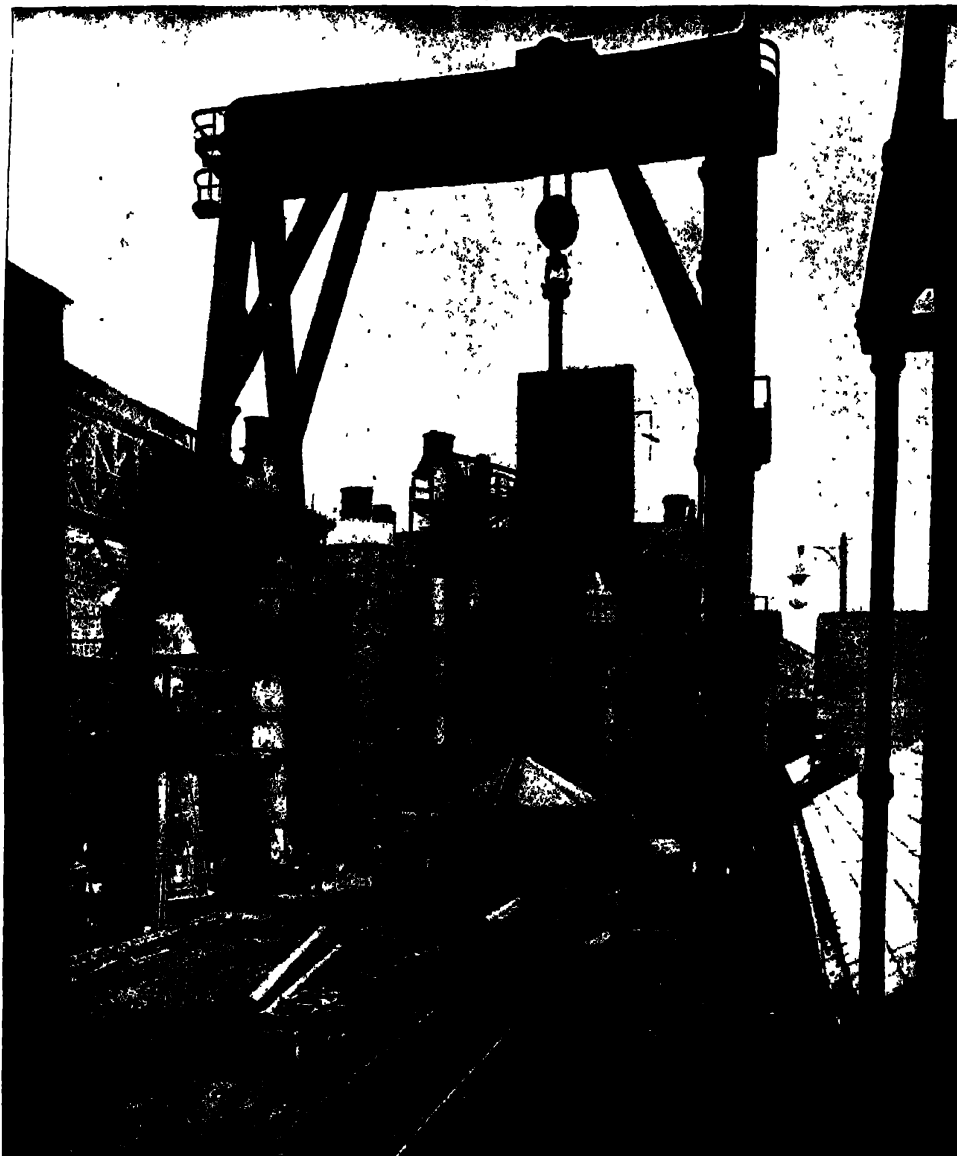


The modern big gun is not a solid mass, but is built of steel tubes fitted one upon another. In this picture we see one of the great barrels of our largest type of gun being forced, or pressed, into shape.



This is the jacket of a big gun, the shaping of which by a hydraulic press is nearly finished. When completed this gun will hurl a shell weighing half a ton a distance of thirty miles in a minute or two.

## DIPPING A 50-FOOT GUN INTO A PIT OF OIL



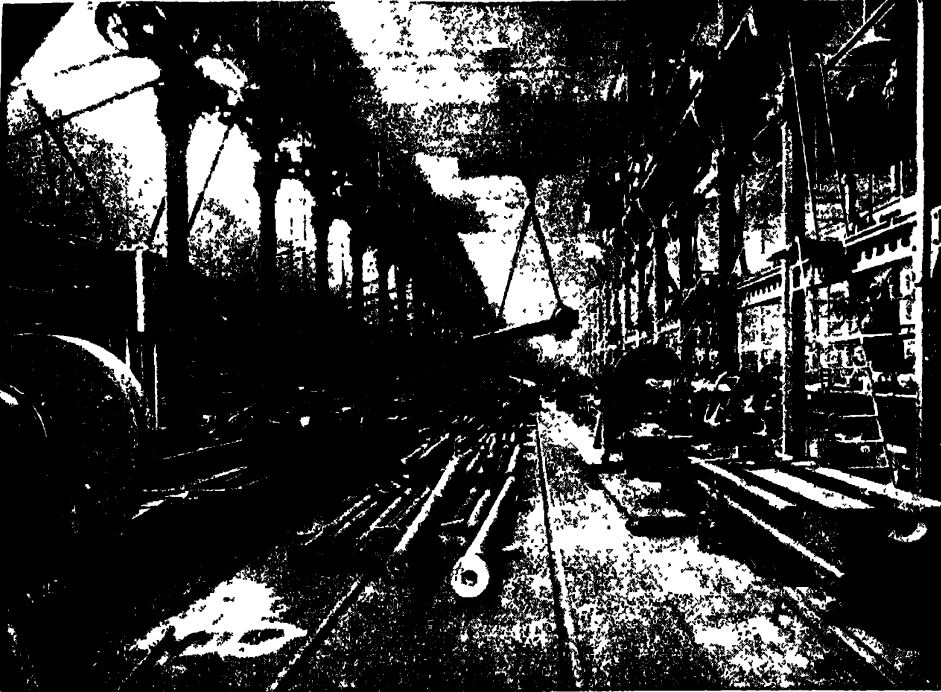
The inside tubes of a gun are cast and forged like the outer jacket. After a tube has been turned, cut into shape outside and bored through the middle, it is heated and let down by a crane, as shown in top picture, into a pit of oil to harden it. It is then taken out, straightened if it has become bent, and turned, or cut, into shape outside. The lower picture shows the outside jacket of a gun being turned.

## PUTTING A BIG GUN'S JACKET ON



The main tubes of the gun are fitted one upon another and sometimes steel wire is wound round them. The wire for one gun is 117 miles long, and would stretch from New York to Hartford. The outer jacket is slipped on, as shown in the top picture. The outside of the gun is turned on a lathe; the inside is again bored so that it may be perfectly even. The bottom picture gives a good idea of the boring operation

## THE INSIDE OF A BIG GUN WORKSHOP

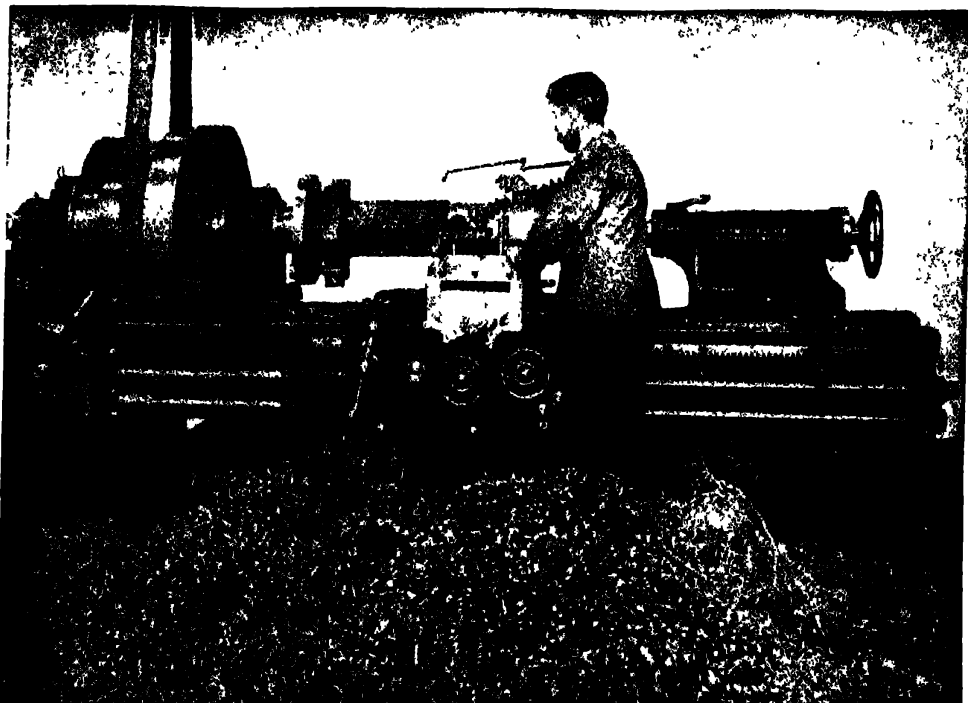


This is the kind of workshop in which a big gun is made. It is of enormous size, and the machinery is the most powerful in the world. Gigantic cranes lift and carry big guns as though they were toys.

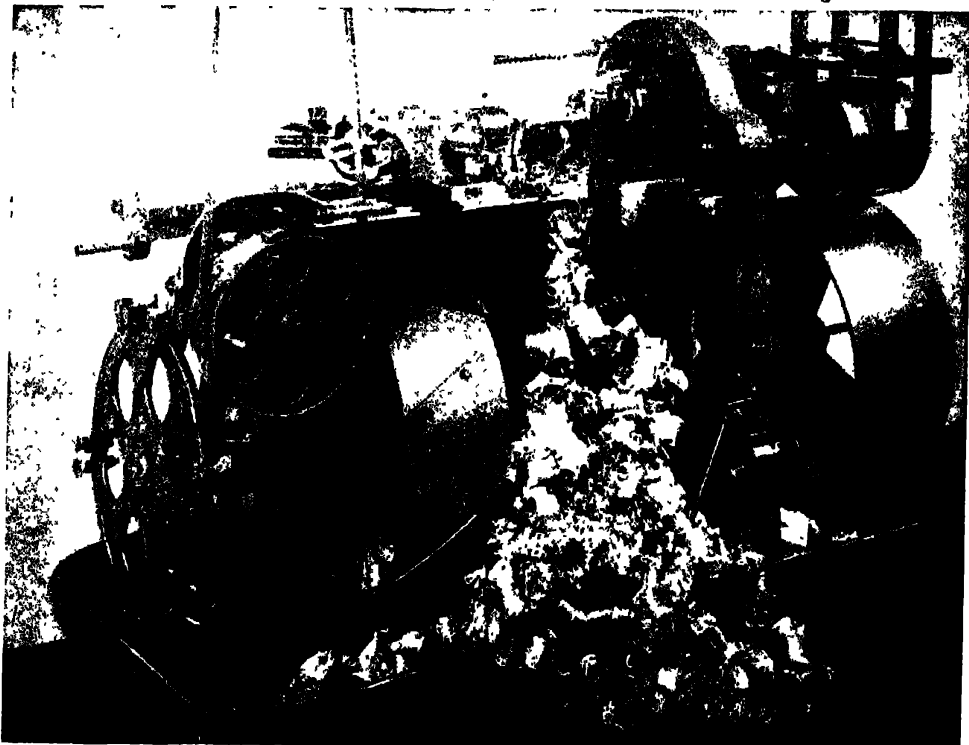


This is the mounting department. When the gun is finished, and has been tested by firing as shown on page 6147, it is brought here and mounded upon a carriage with very clever and elaborate machinery for turning and tilting it. It is then ready for fort or battleship. However good the gun might be, if it were not properly mounted so as to turn about in all directions it would be almost useless in war. Many photographs in these pages are published by permission of Messrs. Vickers, Sons, & Maxlin; Sir W. G. Armstrong, Whitworth & Co.; and Messrs. William Beardmore & Co., in whose works they were taken. Others are by Stephen Cribb.

## THE KNIFE THAT SHAVES STEEL LIKE PAPER



In the boring and turning operations the steel of the guns has to be shaved off. In a small picture this marvelous operation on a gun cannot be well shown, but we can see a small lathe doing the same work.



These pictures show how easily steel can be shaved by a powerful lathe. The big guns are made of the very finest steel that can be manufactured, and to be able to cut such a metal is an engineering triumph.

## WHAT A BIG GUN IS LIKE INSIDE



These pictures show the muzzle of a big gun. On the left the boy on the shoulder of the sailor is looking at the grooves, which cause the shell to twist as it is fired, thus adding tremendously to its speed.



In old days a gun was fired by applying a light to the gunpowder; now elaborate machinery is fitted to the back of the gun to send the shell on its terrible journey. Experience is needed to handle a gun.

## A LITTLE GUN AND A BIG ONE



Picture from Underwood & Underwood, N. Y.

This is not a big gun, but it is one of the most useful guns in warfare. It is one of the famous French "seventy-fives." The French use the metric system, and the bore of this gun is seventy-five millimetres, about three inches. It is very accurate, can be fired rapidly, and seldom gets out of order.



Picture from Brown Bros.

This is one of the great coast defence guns at Sandy Hook. It is mounted, as you see, on a disappearing carriage. This means that when the gun is fired the recoil moves it backward quickly so that it cannot be seen over the top of the pit, except from an aeroplane. When loaded it is brought forward quickly.



## ONE OF THE GREAT KRUPP GUNS



This is one of the great German guns used against Antwerp and other Belgian fortresses. They were fired upward as you see and the descending shells shattered all fortifications against which they were aimed, and reduced them to masses of concrete and twisted steel. Nothing could withstand their force.

Photograph, Underwood & Underwood, New York.

## THE AUSTRIAN GUN WHICH PROVED SO EFFECTIVE



These Skoda guns, firing a 12-inch shell, proved very effective against the Russian fortifications. They are lighter than the Krupps and can be more easily moved from place to place. Both are fired at a great angle, and the shell describes a curve and falls with tremendous force. The shell which is fired is filled with some high explosive, that is, one which changes to gas very quickly. The shell can be arranged to explode in any number of seconds, or upon contact with some hard substance. Copyright, Underwood & Underwood, New York.

## THE GREAT SKODA GUN BEING MOVED TO ANOTHER POINT



A powerful motor pulls the gun, weighing many tons, from place to place when necessary. The gun itself is in the rear, while between is the carriage. This contains, besides the foundation from which the gun is fired, the recoil mechanism which absorbs the shock when the gun is fired and prevents it from shattering itself and everything around. Notice the broad wheels, intended to prevent the crushing of the pavements. Few bridges, however, were able to sustain the enormous weight, and unless the roads were very hard it would sink down into the soil. The men are all needed to take care of the gun.

Copyright, Underwood & Underwood, New York.

## THINGS TO MAKE AND THINGS TO DO



## DRAWING THE THINGS WE SEE

WE are learning to hear the beautiful music that is at the heart of everything. When we all can hear it and love it, then the Golden Age will have come. Many are seeing the dark night change to the beautiful colors of the dawn of this age, and are glad. We all want to see them too, and to feel the gladness.

We have learned already how important it is to look carefully at the boundary lines, so that our minds may compare them accurately before we begin to draw; and we know that the accurate relation or proportion of line to line—that is, their *values*—forms the alphabet of drawing, or the notes of its music. Now we will consider how to look for shapes.

Fill a narrow-necked bottle with water, and put into it the stems of the leaves or flowers you mean to draw; it would make us dislike our drawing lesson if, when we had finished, there were lying before us bruised and dying plants.

Now take a simple-shaped leaf, and put it before a piece of paper similar to that on which you will draw. Thus we shall receive the same impression from our finished drawing as from seeing the leaf against its background. It also helps us to fix our attention upon the leaf, by shutting away all other objects. Draw the leaf just as you see it; do not draw the outline only, but fill it in with crayon the same color as the leaf. When you have finished, put your drawing near to the leaf and sit down again, so that you can see the two—the real leaf and your drawing—from the same view that you had when you drew it.

First let us look at the real leaf, and find out exactly what we want to tell others. Notice that the boundary lines are not up-right; they curve. Now look at the whole shape, and see whether it is as wide as it is long; or if it be half as wide, or a third, and so on. Then notice where the widest part

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occurs—at the half of the length, above, or below it. Observe whether the top of the leaf is more rounded or sharper than the bottom. Thus you will have found just where the curve changes from one direction to another; which position is the rounder and which the flatter. This is most important. Look at both sides, and see the shape enclosed by them.

We know now what to look for, and are ready to compare our drawing with the leaf. We must do so in the same way as we considered the leaf.

We must give our eyes time to see, and our minds time to judge quietly and fairly whether we have drawn a faithful portrait. We are beginning to realize that we cannot draw truly until we have definite knowledge of the boundaries of the shapes. Knowledge must come first. Our drawing should be the result of knowledge of shapes gained by examination. A line by itself means nothing. It is quite right wherever it is placed. A line by itself is never wrong. It can only be wrong when placed into position with the fellow-line needed to complete the shape. It is the shape enclosed that is right or wrong. So when we have judged the values or lengths of lines one with another, we must be careful to draw the lines in just the right proportion. When we draw a line we must be watching its fellow.

Shells are beautiful. This is because they have shapes of different sizes, falling side by side.

Take every shell you have which has a spire. Place these in a row, with their mouths facing you and their spires at the top. Notice that these mouths nearly all occur on the right side as they lie before you; that they are rounder and fuller on the mouth or right side than on the left; that the long line on the left ends with a gentle, inward curve to the canal, or lower

end of the shell. Now decide the position of the mouth—whether it extends half-way, a quarter, and so on, across the shell, and how far up. Count the turns of the winding pathway up the spire, and notice how very much it narrows at each turn. Now draw the shells. Watch carefully the whole shapes, not the boundaries of them.

We see how important shapes are. Let us look at the piece of ornament on this page, and its analysis. We see that under these leaves there are lines of music. This is why the decoration pleases us and is like music to us.

To our list of things to draw we will add objects with curves in them—leaves of every kind, shells, butterflies, and feathers.

Now we will consider objects such as boxes and baskets, objects of which we may see two or more sides, the others being turned from us.

Take a cardboard box, and with the crayons color one side red, another blue, and the top green. Place it on a large piece of white paper, and make a portrait of it on tinted paper just as you see it before you.

Now let us examine the box.

Which is the largest surface, the blue, the red, or the green? Look carefully from one to the other. When you have decided upon the largest, look at each of the others, and compare them in turn. We know now definitely the relative values of these three shapes—that is, we know which is the largest, which the smallest, and which comes between. Look at your drawing, and see if you have put these shapes into their right places.

If they are not right, let us find out why. There must be something wrong with their boundary lines. Perhaps their lengths are wrong, or they do not go in the right direction. Suppose you are standing at the corner, between the red and the blue surfaces. Now put out your arms the way the long lines of the red and the blue surfaces go. You do not put out your arms straight with your shoulders. The left arm goes towards the corner of the room; and the right is

also forward, but not so much as the left one.

Look at your drawing. You represent the middle line between the red and the blue. Do the lines in the drawing go in the same direction as your arms? Then why not?

If you had put in with the white crayon the shape of the ground on which the box stands, you would not have made this mistake. Now place your

drawing near to the box, and sit in your seat again, and compare the two. Does the drawing give us the same impression as the box? Is it like the box? Look from one to the other.

If the shapes are wrong, then we have been strangely unjust. We had before us three shapes to judge. We have not been honest with them. We did not carefully enough compare one with another. So after this queer portrait, or better still, begin again, and remembering this time to get the relative sizes, the

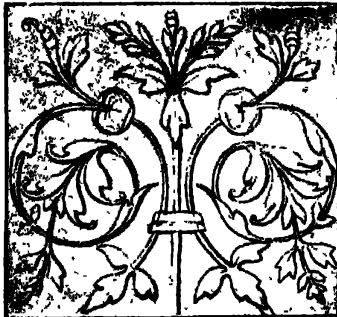
boundary lines, and the correct direction, make another portrait.

We must not forget that in drawing we are dealing with appearances. If we know that a side of an object is really long and wide, but looks

small to us because it is turned from us, we must draw it small. If we know that another side of the object is really small, but appears to be the larger because it is turned towards us, then we must make it the larger. This rule is of the greatest importance. We must always be very careful to draw the surfaces *just the size that we see them*, neither greater nor smaller, notwithstanding our knowledge of what their true size may really be.



Beautiful shapes of feathers.



In the right-hand picture we see the beautiful shapes and lines of music underlying the decoration on the left.



## A PLAY LESSON

Suppose the beautiful princess is going to see her friend at the house in the lovely garden. Her friend will, of course, want to be polite, and to do all possible honor to the gracious princess, and will hurry to bring the chairs out into the garden.

## A GAME OF SKILL WITH CORKS

Now set to work and draw those chairs. Some must face us, some will be sideways, some will have their backs to us. But one has been knocked down by a clumsy maid.

Let us draw this one too. You say that you are not able to draw a chair lying down!

Well, when we want to draw an object that we think we cannot, we must be still for a moment, shut our eyes, and try to imagine it. We shall see it quite plainly after a little while. We shall notice objects much more thoroughly when we have tried to draw them from memory, and so we shall learn how carelessly we have hitherto looked at things.

Make a cardboard chair with no separated legs, really a box with a back. Color it as you did the box, and draw it just as you see it from every possible view. Watch the shapes, as in the drawing of the box.



THE BEAUTIFUL SHAPES OF LEAVES

Let us put in some flowers and grass. Grass is not hard to draw, and we can make our

flowers look natural if we have patience. We might try to draw the princess sitting on one of the chairs.

Now see what else you can put into the picture. Never mind how funny your

drawing looks, or what queer things you draw. Keep on drawing, and then look at real people sitting down. Try to find out why these friends do not look as if they were sitting. Perhaps you have forgotten to bend their legs at the knees, or at the body!

There is nothing more true than the old saying that we learn to do by doing. But we must remember that this does not mean that we shall learn if we keep making, carelessly, the same mistakes every time. We must try to improve.

## A GAME OF SKILL WITH CORKS

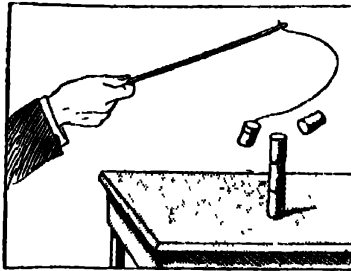
A SIMPLE game that, nevertheless, gives plenty of scope for skill and careful exercise with the hand can be played with a number of ordinary bottle corks. These may be from larger bottles, like those in which we buy vinegar, or they may be from the smaller medicine bottles. The only essential is that they should be fairly good and level corks that will easily stand upright.

The only preparation needed beyond the collection of the corks themselves is the making of what we may call a fishing-rod. Any ordinary thin stick or cane will do, and it should be about eighteen inches or two feet long. To the end of this stick we tie a piece of thin, flexible string about two feet long, and to the end of the string a cork, similar to those that we have collected. The picture shows what the fishing-rod looks like.

Now on a table we pile up the corks, one on top of another, using as many as will stand

in this way, so as to get as high a pile and as many corks as possible.

The game is to stand or sit at the side of the table, and with our fishing-rod gently to flick or touch the top cork of the pile, and knock it off without upsetting any others.



REMOVING THE TOP CORK

Having done this, we try to knock off the next cork, and so on. So soon as we disturb another cork besides the one for the time being at the top which we are removing with our fishing-rod, we lose our turn, and another player piles up the corks once more, and sees how many he can flick off. The player who removes the largest number of corks, one at a time in the manner described without disturbing a second cork,

wins the game. With a little practice we soon become quite skilful. The chief thing to aim at is to hold the arm very steady, and at the same time to keep the wrist quite supple. Avoid quick jerking movements, and swing very evenly and quietly.

## THE WAY TO SHARPEN A LEAD PENCIL

A LEAD pencil that is improperly sharpened is neither useful nor sightly. If the pencil is for sketching, it should be sharpened equally all round so that a perfect point is produced, and the wood should be cut away at a gentle slope. Short, stumpy points and very long, tapering points are equally bad.

If the pencil is to be used for drawing straight

lines, as in perspective work, then it should not be sharpened to a point. Cut the pencil with a long slope on opposite sides, so that the end is chisel-shaped, and then slightly round the angles of this chisel end. A pencil sharpened in this way may be used for line-work for a long time, and the best way to resharpen it is to use a piece of sandpaper.

## TWO WAYS TO MAKE A GARDEN HAMMOCK

WHEN the summer months approach and the fine sunny weather draws nearer, we all like to spend as much time as possible out of doors, and there is nothing more delightful than to lie in a hammock under the shady trees with an interesting book.

It is quite easy for any boy or girl to make a hammock that will be quite attractive and comfortable, without the trouble of learning to do network. We can make a hammock of striped canvas, or of any similar material such as is used for awnings. The size of the hammock depends, of course, upon the size of the person who is going to use it, but if we are going to make a hammock that will take a fully-grown man or woman, we want a piece of material about three and a half yards long by a yard and a half wide. A material with a narrow red stripe always looks pretty.

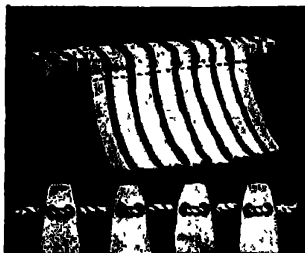
If the material is the full width required, there will be a selvage at each edge, so that it will not be necessary to hem it. At each end of the material we fold over about two inches, and sew it down in such a way as to make a deep hem with room for a stout piece of wood to be slipped through as shown at the top of the first picture. At each end of each stick we cut a small groove or notch, as shown. Then, taking a rope, strong but not too thick, we tie the ends to the grooves in the stick at what will be the head, or upper end, of the hammock.

A similar rope is tied to the stick at the other end of the hammock, which is now ready to be slung from a tree. The length of the rope tied to the sticks at the ends of the hammock depends upon where we are going to hang it and we must decide this, and measure the length of rope required. With a cushion for the head we have a very comfortable hammock, and the cost in money and trouble for the whole of it is very little indeed.

Instead of the pieces of wood, top and bottom of the hammock to keep it spread out flat, we can, if we like, thread the rope through the hem, and when we sling the hammock and get into it, the ends will be drawn together and the canvas become boat-shaped. Some people prefer this style of hammock, and it is as easy to make as the other.

Still another kind of hammock, not so comfortable, perhaps, but yet very useful, can be made for a few cents from old barrel staves. We can easily get some barrels which we can take apart. Then measure off on each stave about two or two and a half inches from the ends, and draw pencil-lines. Using these

lines as guides, we bore two holes at each end of each stave, and then thread the staves together, as shown at the bottom of the first picture, using a strong, flexible, but slender rope, and leaving from one to two inches between the staves. Tie knots at the four ends of the ropes to prevent the staves from becoming unthreaded, and then attach loops so that the hammock may be slung wherever it is wanted. Of course, this simple wooden hammock will not be quite so soft and flexible as one made of canvas or of net, but if it is covered with cushions or with a rug it will make an excellent resting-place.



How the hammock is made.

It is important in selecting our barrels from which to obtain staves that we choose only those that have dry, sound wood. Do not have a barrel in which the staves are at all split or dented. A splinter in one's arm or leg, or a sudden fall, are not among the pleasures that we are anxious to get from our hammock. In hanging a hammock we should always see that there is a considerable stretch of rope at each end.

As regards the first kind of hammock described on this page, if we do not want to go to the expense of buying canvas, we can use an old piece of carpet, or even a couple of old sacks, so long as they are strong and sound. With these, and a long piece of strong rope, we can make a hammock in a few minutes, and if a good rug be thrown over it as a covering, the material of which it is made will be unseen.

The hammock is a very ancient luxury, dating back to Greek times. Columbus, too, found that the natives of America used swinging beds, and it is from them that we get our word hammock. The word comes from the hamac-tree, the bark of which was netted and used by the Indians for their hammocks. In South America, to-day, the hammock is used in all the rubber and coffee plantation



The canvas hammock complete.

camp for sleeping purposes.

Some little skill is generally needed before we can get in and out of a hammock easily, but with practice we shall soon be able to do it.

Amusing accidents sometimes occur when one tries to get out a little too quickly, or else does not take care to keep watch of his balance.

The hammock has such a provoking way of turning upside down, and when this happens, of course what was on the top goes to the under side and one goes straight to the ground, and gets perhaps a bumped head and certainly a surprise. It is well to have two rings attached to the ropes, for when the air is damp the ropes grow shorter, and, therefore, the hammock is raised too high.

## A WORK-BASKET THAT A GIRL CAN MAKE

WE all know the little round wicker baskets shown in the picture below, and called egg or stocking baskets. They cost little, varying according to size, and, properly fitted up, make the very nicest little work-baskets imaginable.

We are going to line our basket with cretonne, and put "workmanlike" little fittings all round to contain our sewing materials.

We shall need half a yard of thin cretonne, with a small pattern on it in pink and blue, or in two other prettily contrasting colors, such as yellow and brown or mauve and green.

First, we cut a strip of cretonne 2 inches longer than the basket is round, and 2 inches wider than the basket is high.

On this strip we sew a couple of little cretonne "patch-pockets," about 3 inches square, and a slot-holder for the scissors, and other things, with four divisions. This is made of a folded piece of the cretonne, 1 inch wide, and about 3½ inches long, as we see in the first picture

Our strip is now ready to be sewn into the basket. We turn in the top edge all along—an inch turning will do—and neatly sew it all round to the inside of the basket with a big needle and thread. We must take care to let the stitches show as little as possible, by using thread the same color as the basket, and we must not attempt to pierce the willow with the needle, but pass it between the pieces, to make the necessary stitches. Where the ends meet we join the cretonne by folding the last edge in, and catching it down to the other.

At the bottom edge our strip will be a little too full, so we arrange it to fit by making a small pleat here and there as we tack down the raw edge to the bottom of the basket. Note that we do not turn in the bottom edge, because it is long enough to lay on the bottom of the basket and be hidden by the bottom cover—which is made separately on a circle of stout brown paper or cardboard cut to fit,

and covered with cretonne. We sew the cretonne to the brown paper with white thread—using big stitches on the wrong side and little ones on the right—all round the edge. A few firm stitches taken through the canes will hold it quite firmly in its place.

We can now, if we like, make a little ruche, or frilling, of inch-wide cretonne, and sew it all round the top edge of our basket, but if we have done our work neatly this is not necessary. The

basket in the picture is finished with a bow of ribbon only.

Now about filling our basket. We shall need a pair of scissors, two bodkins—one large and one small—some needles and pins, pearl and shoe buttons, a tape

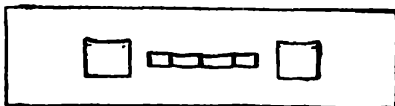
measure, and thimble. With a 3-inch square of cretonne we make a little pouch and stuff it with cotton, and hang it on the side of the basket with a 3-inch piece of cord, as we see in the second picture. We shall want, too, a little needle-book, made in the usual way—a stiff cover and flannel leaves. This we also attach with cord, leaving enough to allow us to get to it easily.

The tape measure we can fold up and slip in one of the slots, with the scissors and bodkins; while the thimble, and any other odds and ends we find useful for sewing purposes, can go in one of the pockets, and the buttons in the other.

The two or three spools of thread, which we must not forget, must be in the bottom loose, where they can be easily found. Every

girl should own her own dainty work-basket where she can keep her thread and needles and other sewing accessories. The man who said he would not marry the girl who spoke of losing "our" needle was quite right, for it implied many lacks beside that of needles and thread.

A fitted work-basket is a very expensive thing to buy, but one like this can be made for a small outlay, and will be as satisfactory as one costing many times as much.



How to arrange pockets and slots on half the length of the slip of lining.



The work-basket complete.

## HOW TO WALK IN A STRAIGHT LINE

IT may seem quite easy to walk in a straight line, but, as a matter of fact, it is almost impossible to do so.

What we must do is to fix our eyes upon two objects in front of us, the one nearer to us being smaller than the one farther away. The two objects must be in line, and as we walk we take care to keep them all the time exactly in a line before us—that is, one object exactly in front of the other in our vision.

As we approach these two objects we must select a third, also in a line with the others,

and after we pass the first object we can use the second and third as our guides. Then, as we approach the second object, we select a fourth, and so on, taking care, as we walk, always to have at least two objects coinciding with one another in our vision. Any objects can be chosen for this purpose, though if they are on a level with the eye it is a great advantage. Trees and shrubs, posts and telegraph poles, stones and hillocks, are only a few of the many objects that will occur to the mind of any boy who determines to perform this feat.



## A ROLL-UP CASE FOR SILKS

THOSE of us who are interested in embroidery should make a little case to hold our skeins of silk. It is rather a good idea to think of such a case as a paint-box, and to use it in much the same way.

For this case, which holds twelve skeins, each in a separate slot, we should need half a yard of crash or colored linen, a scrap of flannel for the needle leaves, and a yard of brown cord. It measures 24 inches by 13 inches, and the piece for the slots, 6 inches by 18 inches. Of course, we can choose the colors we like best; and the outside need not be made of linen, but can be made of silk, cloth, velvet or satin.

The case piece is cut oblong, and afterwards only one end is shaped as shown in the picture below, which shows the case opened out.

First, we hem the material all around very neatly, and then make the little pocket which comes at the other end by doubling the stuff over 4 inches and sewing it down.

This pocket is useful for all sorts of odds and ends, scissors, pencil, thimble, the threader—which we will explain presently—and will even take a small piece of any embroidery we may be working on.

To make the slots, we just hem the 6-by-18-inch strip all round, and then sew it down to the crash foundation in a series of flutes. Each flute will be  $1\frac{1}{2}$  inches of the strip sewn down to 1 inch of the foundation. It will be quite easy to do this if we tick off the measurements on both pieces with a lead pencil, then all we have to do is to join the points together.

The position of the flutes can be seen in the second picture. We sew the strip in the middle of the foundation, starting two inches from the bag, or pocket. At this point we fit in our two needle leaves, neatly notching the three edges with scissors, and sewing the fourth edge just under the first flute. We must "back-stitch" each flute down, and very firmly sew it at each end with several stitches, one over the other, or they will come undone.

The inside of our case is now ready for use, and the only thing we have to get for it is a long pin, or "threader," made of 15 inches of copper wire, just bent exactly like a hairpin. This we use as a bodkin is used to thread

each skein through a slot. It is a good plan to group the different shades of each color together. Thus it is easy to avoid mistakes in matching, and trains our eye to keen perception of color.

The cord is sewn on at the point in front and used as a fastening, and the ends are finished with knots.

The front of the case we shall decorate with a medallion of embroidery—a circle  $2\frac{1}{2}$  inches across, filled with a pattern, worked in crewel stitch, and having its background filled with French knots. We do this on a separate

little piece of crash, cut half an inch larger all around; the edges will be turned in, and we shall hem it to the foundation when finished. In the medallion is a shaggy marguerite.

The pattern for the medallion given in the first picture must be traced off, and transferred to the material by means of a sheet of blue carbon paper. If we have not done any French knots before, we must work a few on

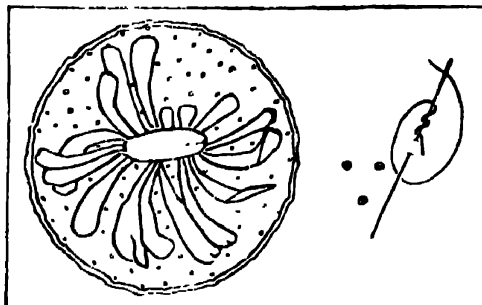
an odd scrap of stuff first. They are not difficult. The thread is brought up to the right side of the stuff, and a tiny stitch is made near the point where the thread comes through; but first we have wound the thread twice round the needle, and after the stitch we have looped it once over the point of the needle before pulling it tight. This leaves a neat knot on the front, and we have only to take our thread through the same hole through which it came to the back before beginning the next knot.

The particular form of decoration shown here

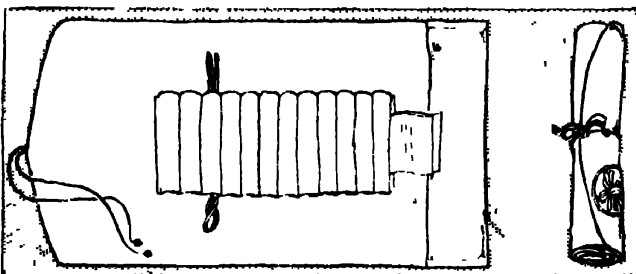
has been suggested chiefly on account of its simplicity. The medallion makes up charmingly, but if we prefer something more elaborate, we can, of course, substitute any pattern that commends itself to our taste.

With clever fingers and a little ingenuity we can make ourselves many such dainty accessories for our needlework. It should be the delight of every young girl to have the contents of her work-box pretty and attractive to the eye as well as tidy and useful.

The girl who keeps her silks this way will save much time which would otherwise have to be spent in untangling them, and we all know that such a task is very provoking to one who is naturally of an orderly disposition.



Design for medallion; how to make French knot.



The case as it appears when opened out and also when rolled up.

## MODELING A BOAT, BELL & MATCH-STAND

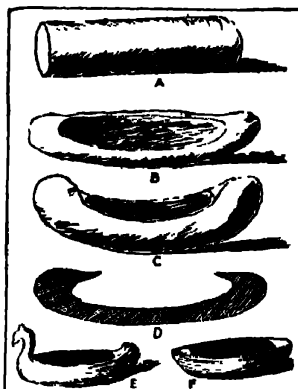
UP to the present the models we have made have been worked up from the sphere, or ball. The canoe, the first of the present set of models, is of a very different character. Instead of using the sphere as a beginning, we take the roll; or, rather, the cylinder. Our method of work, therefore, will be somewhat different. The model will demand considerable skill, and we must not be discouraged if our first efforts fail. The canoe, if made well, and its parts proportioned without too great a bulk of material, will float quite easily. It is to be made by the fingers entirely out of one piece.

Before beginning, we knead our plasticine thoroughly and see that it is fairly soft. Roll out a piece of suitable size to the form shown at A. Then, while it rests on the slate, with the first finger of the right hand press down its length a hollow, or groove, as shown at B. This pressure repeated will cause the material to bend upwards at each end, as seen in the picture.

Now, holding the model in the left hand, continue the pressing, and make the groove deeper, as shown at C. Force the finger-tip

ences in the shape of these, but with practice we should be able to make them with ease.

The hand-bell illustrated has much in the making of it that is similar to the last model. It is quite possible to make it



VIKING BOAT AND CANOE

from one piece of material, but it is better to make it in two parts. The bottom part should be made first. The little sketches, A, B, C, D, show plainly the various stages by which we reach the correct form. Roll out a short cylinder, and, holding it in the left hand with the fingers round it, bore a hole about two-thirds of the way through in the direction shown. This may be done with the finger if it is strong enough; if not, a lead pencil will answer the purpose nearly as well. This will give the appearance as shown at A. Still grasping the cylinder in the same manner, rotate the pencil or finger in the way marked by the arrows in C. This will widen the hole, and cause the spreading out of the end to be evenly done. It thus roughly assumes the bell shape shown at D. With fingers and thumbs mold it carefully until it assumes the correct form, preserving the hollow



THE MODELS AS THEY ARE WHEN COMPLETED

well into the thick substance at each end—see figure D—and work the material well over the space which the finger-tip has made. This will give the sheltered ends. We must not, of course, attempt to make the hollow by cutting out. Cutting or carving is not modeling. The ends are shaped by finger and thumb, and the whole is made smooth by stroking lightly. The exact shape of the ends can be varied to suit our own taste. But we must be careful to make the ends even, otherwise the canoe will not float well, and our model will be spoiled.

This exercise can be used as the basis of many others—the Viking boat, for example, as shown at E; or the ordinary type of boat, as illustrated at F. There are differ-

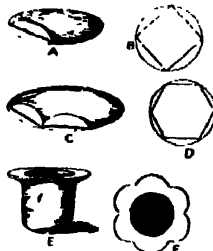
ences in the shape of these, but with practice we should be able to make them with ease.

as shown by the section marked x. We shall see that the material is left thicker at the top, and decreases in thickness down the sides. This is to ensure stability, or firmness, and to allow of sufficient substance in which to fix the handle. Make both the interior and exterior as smooth as possible by gentle pressure while stroking with the fore-finger.

There may be many varieties of handles, but in the illustration marked F perhaps the simplest of all is shown. It is rolled out of a thin cylinder, and modeled by altering the pressure of the hand while it moves backwards and forwards in the process. We shall find it best to use the ball of the thumb for varying the pressure, for if the fingers are used there is a difficulty in preventing the



A HAND-BELL



A MATCH-HOLDER

appearance of ugly grooves across the roll. The length of the handle should be in good proportion to the bell. At the thinner end we should leave a small piece of material equal in diameter to that of a lead pencil, or less if the size of the handle will not admit of this. Bore a hole through the top of the bell, and pass the small end through. The projecting piece is then pressed down on the inside as at G. A few deft strokes with the thumb will unite the two parts.

We shall probably find the match-holders illustrated the most interesting and effective models yet given. Of course, they are only models, and are not intended for practical use, but in them there is much that can be learnt of the art of modeling.

To get the best results, there must be shown taste and feeling in the proportion of the parts, and the whole must be brought to a nice degree of finish. Each model consists of a tray, to which is attached the cup for matches, and each is made in two parts. Let us take number 1 first. The base is square, and it has edges at right angles to it. These edges are themselves curved. It is formed from the flat disk of the earlier exercises. Make the disk in the manner already described, taking care that the edges are pressed out quite thin. It is best to do the thinning out while the disk is revolved between the fingers and thumbs. Now bend up one edge, taking one of the four divisions, which we call seg-

ments, see sketch B, and this will give the appearance as shown in the little sketch at A. The corners may be shaped by gentle pressure of the little finger between each two edges as they are turned up into their positions. The cup for the matches is made in exactly the same way as the bell part of the second model, with this difference—that the top edge is prevented from spreading outwards while the hole is being made. In joining the cup to the tray, the cup is pressed on the raised portion of the centre of the tray, and the two are united by smoothly stroking the two round with the forefinger at their place of contact.

The second match-holder is more difficult, for from the circular disk six equal turned-up edges have to be made to form the tray. This will give what is called a hexagonal shape, as shown at D. If we are doubtful of being able to bend the six edges truly without guiding lines, as at C, we may mark on our disk the hexagon, as shown at D. After the edges are turned up, each one is bent slightly inwards. The tray is now ready for the cup. This is made in a similar manner to that of the first model.

At E we can see the shape to which it should be brought, and the top may be either left plain or scalloped, as in the photograph. The scalloping is done by pinching out the six divisions to the shape, as shown in the sketch plan marked F.

## A WORD GAME WITH SKITTLES

AN interesting word game can be played with skittles or ninepins. We print on each skittle, with either ink or chalk, letters of the alphabet, no letter appearing twice on the same skittle. It is wise in writing the letters on the skittles to give rarely-occurring letters, like q, x, z, only once, and to make up the necessary number of letters with those that are more often used.

When the skittles are ready, we stand them up in three rows, as shown in the picture, the skittles being about six inches apart, and the rows also six inches apart. The distance between our skittles and rows must depend on the size of the ball. Six inches is about the right spacing for a ball the size of a tennis ball. Then we take the two balls, and, from a distance of about twelve



SKITTLES ARRANGED FOR PLAY

feet, we see how many ninepins we can knock over. Now we have to see what letters are on the ninepins that we have knocked down, and from these letters make up words, not using any letter more than once. Sometimes

we shall find that we can scarcely make one word, while at another time we shall be able to make a great many. In making the letters on the skittles, we should see that there is at least one vowel on each skittle, or we shall find that we cannot do much. Every letter of the alphabet should be given at least once, but the additional number required to make up four on

each skittle, two on each side, may be any letters, so if we like we can give three or four a's, or e's, and so on. The player who makes most words in a given time wins the game.

## A CANDLESTICK FROM A GLASS OF WATER

A GLASS of water would not strike one as being a very suitable holder for a lighted candle, and yet by a simple arrangement it may be made into quite a serviceable candlestick.

The glass should have water poured into it for about three-quarters of its depth. A

piece of an ordinary wax candle is then taken, and a nail stuck into its lower end in the same line with the body of the candle. The nail is for ballast, and in choosing it care should be taken that the nail is of such a thickness and weight as to cause the candle to float with a quarter of an inch above the water-line.

# STORY-DICTIONARY IN ENGLISH & FRENCH

## DICTIONARY

**Accents** means tones.  
**Accosted** means went up to and spoke to.  
**Affligé** means afflicted, grieved.  
**Astounded** means amazed, astonished.  
**Banish** means to drive away.  
**Compelled** means forced, made.  
**Concerned** means disturbed, troubled.  
**Délire** means delirium.  
**Diffidently** means timidly, bashfully.  
**En guise de** means by way of.  
**Enthusiastic** means excited about something that pleases us very much.  
**Exquisite** means choice, fine.  
**Extinguished** means put out.  
**Habitait** is the past of **habiter**, to dwell, to live in.  
**Incessantly** means constantly, without ceasing.  
**Induce** means persuade.  
**L'avoir tenu à l'écart** means, literally, to have held him out of the way.  
**Légère** means light.  
**Melody** means tune.  
**Penetrated** means made its way into.  
**Rapprocher** means to bring together.  
**Raves** means speaks wildly and excitedly.  
**Reproaches** means blames, finds fault with.  
**Respond** means to reply. To respond to applause is to play a piece over again.  
**S'échappent** is the present of **s'échapper**, to slip out.  
**Se dirigeaient** is the past of **se diriger**, to direct or guide.  
**Soothe** means to soften, to ease.  
**Tout à coup** means, literally, all at a blow.  
**Vient rompre** means comes to break.  
**Virtuose** means virtuoso, or artiste.

## THE LOVE OF A BROTHER

The great violinist bowed his thanks to the *enthusiastic* audience and ran down the platform steps. The door swung to behind him, but through it came the sound of applause so persistent that it almost *compelled* him to *respond*.  
 But he shook his head. "I'm too tired," he declared, "to play another note."  
 As he stepped into his motor, a boy *accosted* him.  
 "I beg your pardon, sir," he said *diffidently*. "But could you spare a few minutes to play something to my little brother?"  
 The man looked *astounded*.  
 "He's very ill," explained the boy. "He doesn't even know us now, but he's so grieved at missing your concert that he seems unable to *banish* it from his mind. He *raves* about it *incessantly*, and *reproaches* us for keeping him away. The doctor says he must have sleep or he will die, and I thought that if I could *induce* you to play to him just a little, it might *soothe* him. He's mad about the violin. . . . Mother said you'd never come."  
 "But you had more faith in me?" said the violinist.  
 "Where do you live?"  
 The boy told him, and in a few minutes they were on their way to the house where the sick boy lay.  
 At one of the windows a light shone.  
 "That's the room," said the boy, as they paused for a moment in the little garden.  
 The man did not answer, and the boy slipped away. For a while there was silence, and then suddenly the stillness was broken by an *exquisite melody*. Note by note it fell, till the air was flooded with its sweetness. It *penetrated* the sick-room, and brought joy and peace to the little sufferer; the restlessness ceased, and the tired eyelids drooped till at last they closed in a deep sleep.  
 The man in the garden below watched till the curtains were softly drawn and the lights *extinguished*, then he put his violin back into its case and vanished in the darkness.

## L'AMOUR D'UN FRÈRE

Le grand violiniste salua *en guise de remerciements* l'auditoire enthousiasmé, puis descendit l'escalier de la scène en courant. La porte se referma sur lui, laissant entendre des applaudissements si persistants qu'ils l'obligèrent presque à répondre.  
 Mais il secoua la tête. "Je suis trop fatigué," déclara-t-il, "pour jouer une note de plus."  
 Comme il montait dans son automobile un petit garçon l'accosta. "Excusez-moi, monsieur," dit-il timidement, "mais pouvez-vous disposer de quelques minutes pour jouer quelque chose à mon petit frère?"  
 Le violiniste parut abasourdi.  
 "Il est très malade," expliqua le petit garçon. "Il ne nous reconnaît même pas maintenant, mais il est si *affligé* d'avoir manqué votre concert qu'il ne peut en bannir l'idée de sa tête. Il en parle *incessamment* dans son *délire* et nous reproche de *l'avoir tenu à l'écart*. Le docteur dit qu'il lui faut du sommeil ou, sinon, il mourra, et j'ai pensé que si je pouvais vous décider à lui jouer quelque chose, les *accents* de votre violon le calmeraient. Ah! il est fou de ce violon! . . . Ma mère disait que vous ne viendriez jamais."  
 "Mais toi, tu as eu plus de foi en moi?" répondit le violiniste.  
 "Où demeures-tu?"  
 Le petit garçon lui dit où il *habitait*, et quelques minutes après ils *se dirigeaient* vers la maison du jeune malade. Une lumière brillait à l'une des fenêtres. "Voilà la chambre!" dit le petit garçon, en s'arrêtant dans le jardin.  
 Le *virtuose* ne répondit rien, et le petit garçon s'esquiva. *Tout à coup* une douce mélodie *vient rompre* le silence de la nuit. Les notes *s'échappent* les unes après les autres, remplissant l'air de leur charme. Elles pénètrent dans la chambre, apportant la joie et la paix au jeune patient; l'agitation cesse, et les pauvres languissantes de l'enfant se ferment enfin sous l'action d'un profond sommeil.  
 L'artiste dont l'œil était resté fixé sur la fenêtre voit une main *légère* en *rapprocher* les rideaux et la lumière s'éteindre, alors il replace son violon dans la boîte, et disparaît.

# HINTS AND TRICKS FOR ODD MOMENTS

## THE MYSTERIOUS CUBES

HERE is a curious design. Let us look carefully at it, and say whether we can see three cubes with their right-hand sides hidden and their left-hand sides showing black, or three cubes with their left-hand sides hidden and their right-hand sides showing black. In other words, are two cubes resting on one cube, or is one cube resting on two? While we are looking at the picture and trying to answer the questions, we shall probably get very mixed in our minds, for at first the cubes will seem to be in one position and then they will suddenly seem to change their position.



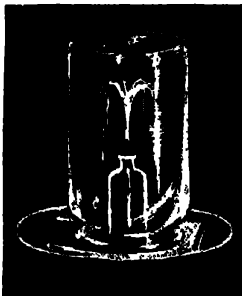
## A TOY TO DISGUISE THE VOICE

A SIMPLE little instrument can be made out of a piece of bamboo, which will enable us to disguise our voice, so that our friends will not recognize it. We take a piece of bamboo about the thickness of a walking-stick, and three or four inches long, and remove any pith there may be inside. Then we cut a notch at each end, on opposite sides of the bamboo, as shown in the picture. Over each end of the bamboo we stretch tightly a piece of thin tracing paper. Then, with a large pin, we prick a hole in each piece of tracing paper. The instrument is now ready, and we may begin our experiments upon our friends.



## A LITTLE FOUNTAIN IN A JAR

THIS picture shows how we can make a little fountain in an inverted glass jar. Any kind of glass jar will do - one in which we buy pickles or jam, for instance. We take a small bottle about half the height of the jar, and fill it about three-quarters full of water. Then we cork it well with a cork in which we have previously bored a hole. Through the hole we pass a glass tube long enough to reach nearly to the bottom of the bottle. About an inch of the tube should project above the cork, and we should seal the cork to the bottle all around with soap or wax, so that no air can get in. In a plate or tray we place several layers of wet blotting-paper, and stand the bottle in the middle. Then we take the glass jar and, warming it well, place it mouth downwards over the bottle. In a few minutes the air in the jar, which was warm, will get cool and so take up less room, thereupon a small



jet of water will at once spurt from the tube of the little bottle.

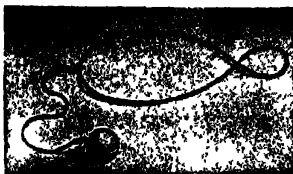
## A DIFFICULT DRAWING TRICK

THERE is a drawing trick which seems simple, but is very difficult. Let us take a book or board, and place on it a sheet of paper. Then, holding the board with the paper horizontally, let us stand immediately in front of a looking-glass, and, looking in the glass, try to draw on the paper a square and its diagonals. Of course, we must not look at the paper itself or the pencil while drawing, but only at the reflections in the looking-glass. It is surprising how difficult it is to get the lines at the right angles.



## A HOME-MADE CUP AND BALL

IT is quite easy to make a toy that will answer the purpose of the well-known cup and ball. We take a piece of wire about two feet long, and bend it as shown in the picture. Then we take any ordinary ball, or, if a ball is not available, make one out of anything that is handy, and tie this to the wire with a piece of flexible string about a foot and a half long. The toy is then ready for use, and the game is to hold the wire by the handle, and see how many times we can swing the ball through the loop without letting it touch the wire. Any number of players can join in.

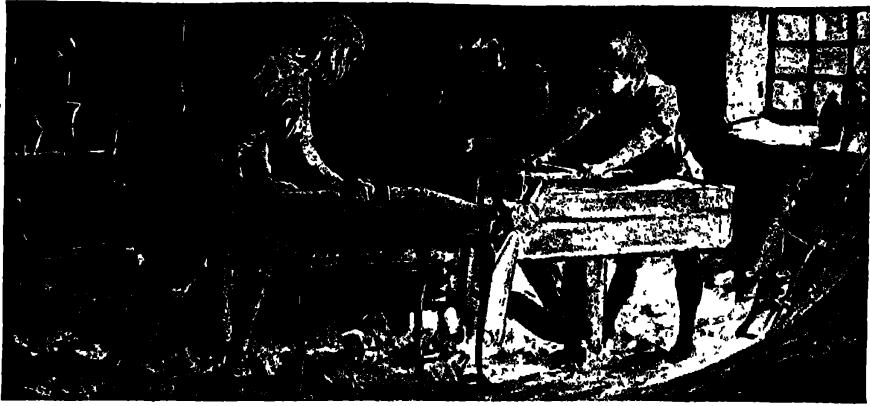


## A LEG TRICK

THERE are many simple tricks for boys, which seem quite easy to do, but which, when attempted, prove to be anything but easy. Let us put our leg on the table in the manner shown in the picture, taking care that our heel and the back of our knee are both touching the table. And then let us try to untie our shoelace.



CONTINUED ON PAGE 6277.



Chippendale the carpenter at work, making one of the tables which have made his name famous.

## MAKERS OF BEAUTIFUL THINGS

### THREE WORKMEN WHOSE WORK LIVES AFTER THEM

WE have all heard people say of some piece of furniture, "That is real Chippendale!" It is only children, the great questioners of the world, who dare say, "What do you mean by real Chippendale?" They are answered, "It means that this furniture was made by Chippendale"; or "It is furniture made in what is known as the Chippendale period." But if a child goes on to ask, "Who was Chippendale, and what was the Chippendale period?" he may cause his elders some little difficulty.

Very often when we speak of an article of furniture which we believe to have been made in the eighteenth century, we call it "Chippendale," believing it to belong to the so-called Chippendale period. But we are in error in doing so, for the real Chippendale period was the time of Chippendale's life and work, and only professional dealers in old furniture, or those who make furniture their special hobby, can tell when we are right in so describing our treasures.

There is a good story about Homer. A puzzle-headed scholar, who had been studying long and hard to find

CONTINUED FROM 617



out whether the great poet really wrote the work which made him immortal, put it in this way: "Well, you see, the poem was not really written by Homer but by another chap of the same name!" Chippendale,

who gets credit for work he never did, is to the collector of beautiful furniture very much what Homer is to the lover of literature. He looms out of the past as a great name, doing splendid work himself, and becoming, as it were, the father of most of the good work of the same sort which followed.

Furniture is not all of life, but it plays an important part in our home education. To live all our days among ugly furniture has a lowering tendency upon the mind. It debases our taste. We grow accustomed to the sight of ugly, inartistic things, and do not appreciate anything better.

This spirit of ignorance and indifference prevailed with regard to the entire home until the great artist, William Morris, set to work to reform taste, and make the home beautiful. Chippendale was an earlier Morris, in a smaller way, and his work was a miracle. Why should one little, un-

known man declare that all the furniture being made, whether for the rich or the poor, was bad, common, trashy? What would happen to a little tailor, or some poor dressmaker, who tried to do the same thing to-day in regard to clothes? Chippendale had an artistic soul, and he must have had enormous courage.

Furniture for English homes had

We know nothing about his private career, not even the dates of his birth and death. All we know about him personally is that he was a native of Worcestershire, and that he went to London some time before 1750, and set up in business as a cabinet-maker and upholsterer in St. Martin's Lane, and that he died in the year 1779. He began to

make furniture in a new way. He did away with the stuffy upholstery for chairs, and made them with open backs; strong but handsome. He gave them true beauty by making them for use as well as for ornament.

Chippendale set his face against the ugly furniture with which the houses of the rich were packed. He carved chairs which could be sat upon; tables which could be used with comfort; sideboards which were really useful as well as beautiful.

And Chippendale's furniture was a tremendous success. It is wonderful that so great a change should have been welcomed in England as it was. If a king or some leader of fashion had ordered furniture of this type, it would have been easier to understand its success;



THE CORNER OF AN ADAM ROOM

undergone many changes before the day of Chippendale and his school. The Saxon style was barbarous and rough; the Norman was elaborate and heavy; various Continental styles were blended into one for another fashion, with the result that all the original grace and beauty were lost, and only bad, jumbled copies remained. Chippendale found English furniture of this sort, and he set himself to reform the public taste.

but here was a quite unknown man, forsaking all the old fashions, and creating a style for himself, delicate, carefully carved, and sometimes very elaborate.

Chippendale seems to have made a great success in business but he was not satisfied with that. He was not content to know that the houses into which his furniture went were beautiful. This cabinet-maker, with an artist's mind, set out on a mission to convert other cabinet-

makers and their patrons. In 1752 he wrote a book on his trade. It taught cabinet-makers how to make beautiful furniture, and it taught others to respect and admire such work. Many of Chippendale's designs were included in the book. Five years afterwards a second edition of the book was published, and three years after that a third appeared. In this third edition, however, he unfortunately allowed drawings and designs by other people to appear, and his high reputation suffered from these. Probably it suffered a good deal more from a book of forgeries which was published after his death. In spite of this, however, Chippendale had a very great influence for good. A large number of his books were sold and studied, and they helped to change the whole art and style of furniture-making.

We may have heard of an "Adam house," or of an "Adam fireplace," or "Adam furniture." Those of us who have troubled our minds in the matter know that Robert Adam was an architect, not a furniture-maker. None the less, Robert Adam was one of the great figures in the movement for the reform of the English home. He was the son of a successful architect, and was born in Scotland in 1728. He studied at Edinburgh University and in Italy, and he had three brothers almost as gifted as himself. These were the men who built that part of London which, lying between the Strand and the Thames, was called the Adelphi. They built some of the finest houses in

London, and many in other parts of the country.

The point in Robert Adam's career is his skill in making beautiful the inside of houses. It did not satisfy the brothers merely to build a house which was handsome from the outside. They designed all sorts of beautiful tables and chairs, sideboards, fireplaces, book-cases,



THE CORNER OF A SHERATON ROOM

brackets, candelabra, pedestals, clock-cases, mirror frames, and so on. They designed plate and carriages; they even designed a Sedan chair for Queen Charlotte. They refined every branch of domestic art that they touched, and as they were among the first architects to make fine large windows to admit light and air, we, who know the great value of sunshine and pure air to us, should feel especially grateful to them.



With such a lead as Chippendale and the Adam brothers had given the country, it is hard to understand why afterwards there were so many shoddy homes in

only the furniture expert can distinguish their furniture from others of their time.

George Hepplewhite died ten years later than Chippendale, and, as he carried on business in London, they may have known one another. Hepplewhite is believed to have made a good deal of the fine painted furniture which is prized by collectors, but we usually think of him as a maker of furniture inlaid with beautiful woods.

All we know about William Ince and Thomas Mayhew is that they also lived in London in the eighteenth century, that they were partners, and that they published between them a book of designs. Of the two, Ince was the better cabinet-maker, and although his furniture



A CORNER OF A CHIPPENDALE ROOM

England, for the good work spread far and wide, and many artists in furniture now appeared. There were Hepplewhite, Ince, and Mayhew, among others, but

is more slightly built, it is sometimes mistaken for Chippendale.

Another maker of furniture who also lived in the eighteenth century, and one

whose name is better known to us than anyone of the three, was Thomas Sheraton, who was born at Stockton-on-Tees in 1751, and died in London in 1806. He first came into prominence in his native town by a book on religion. In his first book he described himself as a mechanic, though he was really a carpenter and furniture-maker. The



A Sheraton Clock

strange thing is that, as a furniture-maker, he was not successful. He had splendid ideas, but could not carry them out. He could design and teach others, but his proper work was not the actual making of the furniture which has made his name famous. He gave up furniture-making, and at thirty-nine removed to London, where he at once started to publish works on furniture-making. He had studied Chippendale, and declared that, while that excellent man's designs were admirable for the time in which he lived, they were now out of date. He little dreamed what later generations would think of Chippendale furniture.

Sheraton was wrong in his judgment as to Chip-

pendale, but he was right in his judgment as to how furniture should be made in his own day. He was one of those wonderful men who do great things without formal education. He was by nature an artist, and he taught himself drawing and geometry, and, thus equipped, he set out to teach the world by means of books that he published. He cried out for still greater simplicity of design, a more severe beauty than

Chippendale's, and a style far removed of course, from that which Chippendale's had overthrown. In furniture, he said, we must have usefulness, not attempts at beauty alone, if the lines that we follow are sound, beauty is bound to result. It is harder, he declared, to reach successful simplicity than the highest development of the fanciful French style which was then in fashion. All artists agree that he was right, and to-day Sheraton furniture is very highly prized—that is, furniture made from Sheraton's designs. The pity is that Sheraton's books were never a success, from the money point of view. He died in poverty, yet a good suite of his furniture to-day would sell for enough money to have kept him in plenty all his life.

These men were the chief of those who first strove in England to make the home beautiful. They laid good foundation, upon which careful technical artists have built ever since. Why, then, the return to shoddy ugly furniture? Perhaps it was through the introduction of machinery. Population increased, and huge supplies of furniture were needed. In the factory, where machines did the work which careful craftsmen once did by hand, it was impossible to pay the same artistic, loving attention to work. The older men had only a few persons in their employ, and could oversee every bit of work done. There was no hurry, no rushing. The factory with its machinery altered that,



Chippendale Bedposts

and the work suffered. In the second half of the nineteenth century, however, a revival of interest in the art of furniture-making set in.

In this country a renewed interest in furniture seems to have been aroused when travelers and dealers in antiques began to bring from Europe some of the beautiful things that they found for sale over there. This furniture was copied by the designers employed by furniture manufacturers, models were made from it to fit our needs, and there is now no reason why even the simplest home should be disfigured by ugly things.

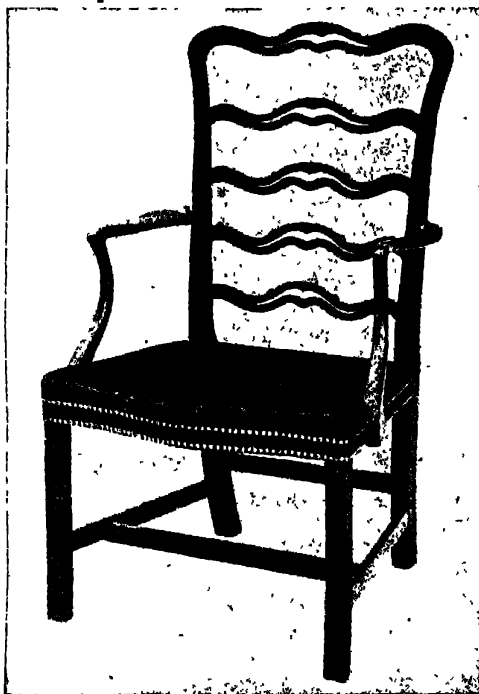
In this country we had no great furniture-makers whose names stand out like those of the men of whom we have been reading, nevertheless it is a mistake to think that there was no fine furniture made here in colonial days.

When the first settlers came they had to be content with the simplest benches, tables and cupboards, but we must remember that at that time the same thing was true of the great majority of people who lived in the lands from which they came. In a short time, however, some of the best furniture made in England was brought over, for the houses of the governors, wealthy planters and men of note, but space in the ships of those days was very limited, and even in the houses of wealthy people much of the furniture was of home manufacture.

Probably the first simple furniture of the log houses of the pioneers was made by themselves. Blocks took the place of stools for the children when they gathered round the hearth. An axe-hewn plank, laid on trestles, did duty for a table. Bedsteads were made of poles and the sides lashed together with rope. But these days soon passed. No sooner had

the settler been able to make a water-tight house than he attempted to make better things. Home-made rush-seated chairs, carved chests made from hand-hewn lumber, and well made tables, gave added comfort to the homes of the pioneers. Besides there were carpenters and cabinet-makers among the settlers, who used their skill in supplying the needs of the communities in which they lived. Indeed many men who were not cabinet-makers, but whose fingers had become deft at other work, and who loved beauty, made furniture for themselves that was

very creditable in shape and finish. For instance, this writer has seen a handsome desk that was made by a weaver, in the end of the eighteenth century, and has since that time been in the possession of his descendants. The greater part of the colonial furniture, however, was made by cabinet-makers or by carpenters who copied the new styles of furniture that were brought over from Europe, in wood from the beautiful trees, that were felled in the forests around them.



Courtesy Metropolitan Museum of Art.

#### AN EIGHTEENTH CENTURY CHAIR

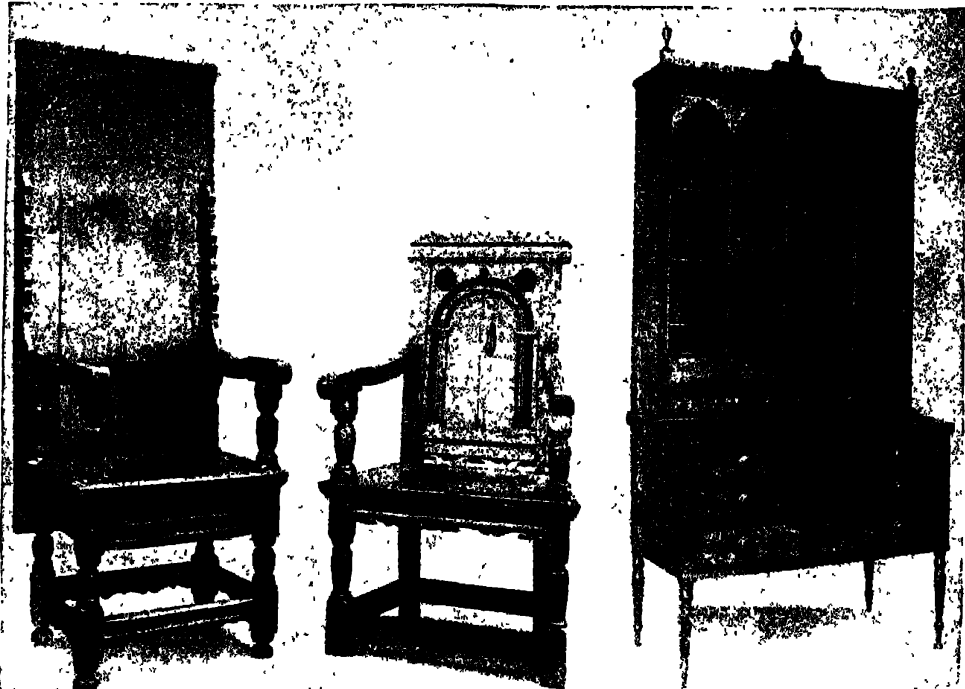
Many of these colonial furniture-makers had not the tools or the skill to give to the things that they made the extreme beauty of line that we find in the best furniture that came from abroad. Most of them were not able to cross the fine line that divides what we call good from what we call excellent. Their tables and chairs and cupboards were just a little heavier in make and clumsier in outline than those from which they took their designs. Nevertheless men and women now treasure, with pride, antique furniture which they suppose to have been brought from the Old World, but which really was made in some village in New England or in the South.

The colonial cabinet-makers were espe-

cially successful in making large pieces that were difficult to import. Handsome highboys, in which the wardrobes of a whole family of children could be stored away, were almost peculiar to this country, and when you see one you may be almost sure that it is of colonial make. The pictures on these two pages give an idea of the best type of furniture made in the seventeenth and eighteenth centuries.

We really know nothing of the lives of the men who made these things. In fact,

of Louis XIV, Louis XV and Louis XVI gives us an idea of the houses of the nobles who lived in the luxurious reigns of these monarchs. There are carved dower chests from Central Europe. There is a large room with old carved furniture made in England in Tudor times and in the reign of James I, and this is of great interest to us, for it shows us how the old homes of our ancestors were furnished at the time they left them. Then there is a large hall filled with fur-



These chairs were made in this country in the seventeenth century, and may well be compared with some of the old carved furniture made in England in Tudor days. The beautiful desk was also made in this country, about the year 1800. Chairs and desk are now in the Metropolitan Museum of Art in New York.

the only cabinet-makers whose names we know are David Phyffe, who has been called the American Chippendale, and possibly one or two more. But not only the furniture that these men made, but fine doorways, handsome chimneypieces, and graceful, curving stairways into which he had put all his love of good work, were the pride and joy of many a village Sheraton or Adam, and are now the pride of their owners, especially if they still belong to the families for whom they were built.

There is a very fine collection of old furniture in the Metropolitan Museum of Art. Rooms are furnished in Chippendale furniture, in Sheraton and in Adam furniture. French furniture of the time

niture made in America in the centuries of which we have been speaking, and we may study it ourselves and compare it with the furniture made in Europe. There are highboys and lowboys, tables, desks and chairs, cabinets and carved chests, and chests of drawers. The pictures on these two pages are photographs of furniture in this collection. Other collections of furniture, some of domestic manufacture, and some brought from abroad, are to be found in the colonial houses, throughout the country, which have been turned into museums. The mission furniture with simple lines, that is so much used nowadays, is copied from the furniture used in the Spanish Missions.

THE NEXT STORY OF MEN AND WOMEN IS ON PAGE 6249.

# THE GREATEST MONUMENT ON THE EARTH

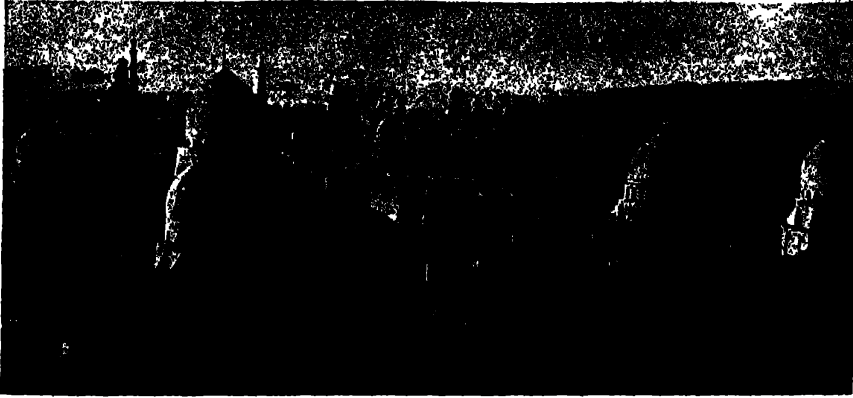


The Pyramids, 6,000 years old, standing in the sands as when Abraham must have seen them.



The six-mile avenue of acacia trees leading from outside Cairo to the Pyramids.

Upper picture copyright by Underwood and Underwood.



Old Cairo, with the tombs of the Caliphs, and the Citadel in the distance.

## THE GREAT SIGHTS OF EGYPT

THE world has made haste since Pharaoh died, but nothing more wonderful has happened under the sun than the change by which we may sit reading THE BOOK OF KNOWLEDGE in New York on Monday, before another Monday be in London, and on the following Saturday may cross the desert at Thebes, and walk among the Tombs of the Kings. In one week we may walk on the ashes of two dead empires; we may look on the ruins of Rome and walk among the ruins of Egypt. Between one Sunday and another we may sit in the shadows that fall from all that is left of the palaces of Cæsar and the temples of Pharaoh. We go six thousand years back in six days.

It is strange to arrive after so swift a journey from New York in such an old corner of the world as Port Said, where the traveler for Cairo parts from the traveler for India. The ship sails on its way to India, up the Suez Canal into the Red Sea. The passenger for Egypt takes train for Cairo, and the journey takes about four hours. And as he goes he catches glimpses of the canal here and there, and peeps of some of the queer corners of Egypt. At last, less than two weeks after leaving New York, he is in Cairo.

CONTINUED FROM 6105



Nothing that the traveler has ever seen is quite like Cairo—if he has never been to India, or Damascus, or Constantinople. The color of Cairo is something that no one ever forgets. The panorama of human life which never ends; the tens of thousands, hundreds of thousands, of lives which nothing seems ever to perturb; the glow of the city in the sun from the height of the Citadel, with its miles of domes and minarets; and the river which brings life to Egypt winding in the background; and far beyond, ten miles and more from where he stands, the Pyramids and the desert make an abiding impression on the traveler's mind.

Cairo itself is wonderful. Only a great artist or a great writer could hope to give you some suggestion of its color and its humanity. You would not be surprised if you were told that in those bulrushes Pharaoh's daughter found Moses; your surprise would be that Moses was not there. You may fancy that yonder Arabs in the desert are Joseph's brethren; for all the change that has taken place they well might be.

Hawks fly past you as you walk in the street, buffaloes draw carts and ploughs, white donkeys and black ones

with blue necklaces bear half the burdens of the town. The faithful Mohammedan prays in the field; the unfaithful cries "Backsheesh!" as you pass. The women hide their faces behind thick veils; the children alone seem even as you and I.

**THE GORGEOUS BAZAARS PACKED FROM MORNING TILL NIGHT**

The wonderful bazaars can never be described. They are packed with things to eat and things to wear. A host of busy folk, tailors, jewelers, polishers, shoemakers, coffee-grinders work in the doorways or the open shop fronts. The ancient streets of this old part of the town are full of busy life and packed with gorgeous color. Even the pavements of the dirty streets provide a working place for merchants.

At every turn some little group is busy roasting chestnuts on the curbstone even at midnight; making coffee on the pavement for the passers-by; displaying their rings of bread and plates of strange confections on the ground.

Hear the cackling hens in the shops, the stray sheep and goats in the busy streets. *Feel* the misery of these happy people. Smell their streets and shops. Escape, if you can, from the heap of fish in that window, from the basket of onions in this, from the carcasses in that butcher's shop. Turn the corner and see their tobacco shops, the damtiest imaginable. Step inside their mosques; put your feet into yellow sandals and see them at their prayers. Climb the steep hill to the Citadel and see the glory of Cairo, the wonderful, unmatched, and unforgettable panorama of a hundred square miles of fertile plain and yellow sand.

**THE SCENE UPON WHICH THE SUN HAS SET FOR CENTURIES AND CENTURIES**

See Father Nile flowing, as he has flowed ten thousand years, still bearing a prehistoric craft past great palaces and banks lined with palms; with the dim background of the distant desert rising against the sky, the great Pyramids of Ghizeh, ten miles distant, plainly seen, and those of Sakkara, more distant still, looming beyond.

Stand here on the Citadel and watch the sunset over it all, and remember that the sun has set over it for more centuries than you can count years, and that in the plain lying before you empires have been born, empires have been lost.

People the arena with great people of antiquity of whom we have learned—Julius Cæsar, Mark Antony, Cleopatra, Moses, and the Pharaohs; and then walk slowly down the hill, see the human relics of this greatness, and wonder what life and the world means. Take a carriage at the bottom, and drive ten miles. Three miles bring you to an avenue lined with trees—"the avenue that never ends," and about you are oranges, bananas, and dates in the gardens, and buffaloes at work in the fields, led by men in long blue robes.

**THE GREAT SHADOW THAT CREEPS ACROSS THE SAND**

Ahead, just in front of you, at the bottom of the way, stand the Pyramids. A mile goes past, and then another, and another, and still, in front of you, these great things rise. Then at last the desert, the greatest structures that were ever built in stone, and the strange, wonderful Sphinx.

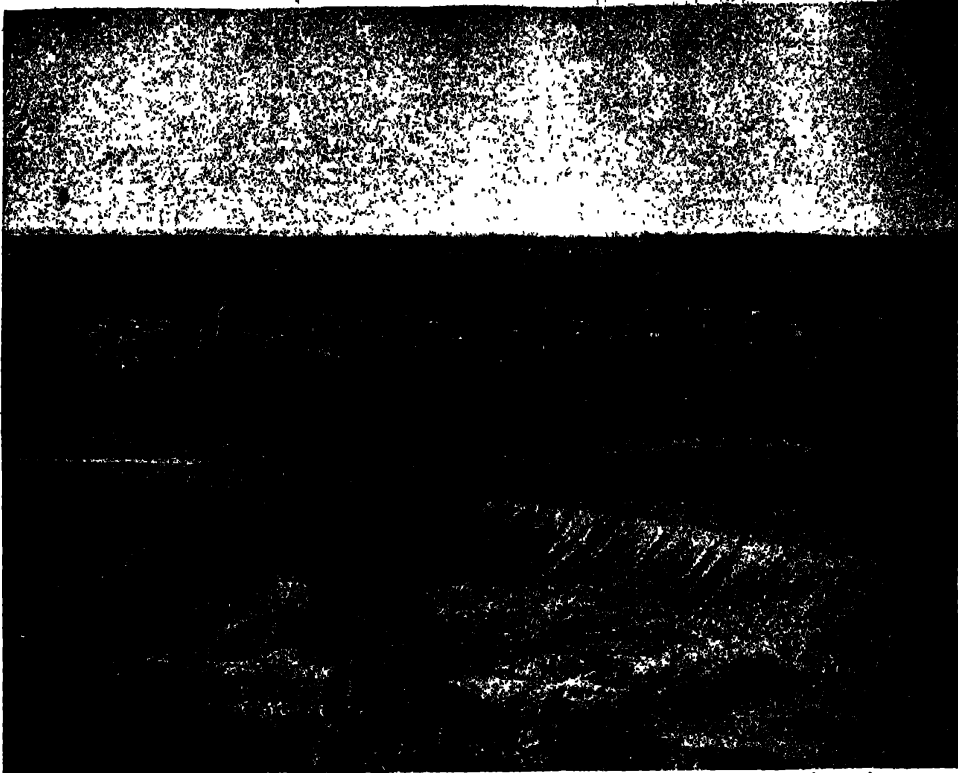
We are at the Pyramids, one of the most famous places in all the earth, and we watch the shadow of the Great Pyramid—the greatest of the three—creep along the sand. The sun shines down on it to-day as it shone on it when Abraham saw it, and Moses was brought up almost beneath its shade. The moon looks down on it to-night as on that night when a mother brought her Child down into Egypt to flee from the wrath of Herod.

**THE USELESS LABOR OF A HUNDRED THOUSAND SLAVES**

The Great Pyramid is the greatest monument ever set up on the earth, and the only monument on the face of the earth which looks to-day, at any rate from a distance, almost exactly as it must have looked 6,000 years ago. We sit in the sand and gaze at it with wonder.

For twenty years a hundred thousand slaves worked to build this single pyramid, which is the greatest of the three that rise from the sand near Cairo, and was built to hold the dead body of a king. It is nearly three times as large as St. Peter's in Rome, and fifty feet higher. Its foundations are set in thirteen acres of sand, and the stone it contains is nearly 90,000,000 cubic feet, or enough to make a pathway, a foot wide, two-thirds of the distance round the earth.

## CAIRO AND HER STRANGE BAZAARS



Cairo, the ancient and modern capital of Egypt, with the Pyramids in the desert beyond.



A confectioner's and a fishmonger's shop in the famous bazaars in the old part of Cairo.



## THE LIFE OF AN EGYPTIAN BOY



The great Arab university at Cairo, where thousands of boys study the Koran all day.



Arabs drawing water from the Nile with the schadouf, a sort of see-saw with buckets.

# THE RIVER THAT GIVES LIFE TO EGYPT



CAMELS ON THE BANKS OF THE NILE AT ASSOUAN



WATER-CARRIERS FILLING THEIR SKIN BOTTLES FROM THE NILE

**THE DARKNESS INSIDE THE GREAT PYRAMID**

Six hundred miles up the Nile is the great Assouan Dam, which holds back enough water to make the desert of Egypt blossom as the rose, and this huge dam has just about a quarter of the quantity of stone that is piled up in the great pyramid!

It is hard to understand the feeling which leads the traveler to climb the pyramid. The climb is perilous and difficult. It takes hours, and the climber needs the help of two or three men. It is easier to persuade oneself to go inside, but he who has once been in will surely never wish to go again. A small hole, which faces toward the North Pole, leads into a long, low, descending passage, through which three Bedouins lead us into this dark and terrible place, and we fumble on hands and knees, and climb up slippery slopes, and walk along narrow ledges, and are slung through holes until the darkness and the weirdness are almost more than we can bear.

With a sigh of relief, we reach the little chamber in the heart of the Great Pyramid, with the tomb of the builder in the centre of the floor and with millions of tons of masonry above our heads—enough of it, men say, to have hidden away miles and miles of galleries such as we came through, and more than three thousand chambers such as this in which we stand.

**THE RIDE TO THE PLAYGROUND OF MOSES**

An overwhelming thought it is, a terrifying place it is to stand in, and we would give much for a breath of the air that lies hundreds of feet away beyond these dark winding passages. Our Arab guides know it, too, and this place and this moment they choose to extort from their victim as much money as he will unwillingly let go. And the traveler pays, takes up his candle, and gropes his painful way back to the desert and the sun.

He is glad to mount his camel, to ride quickly by the Sphinx, which, if he is wise, he will come again to see by moonlight; and on he rides, across twelve miles of sand to Memphis, through the groves of palms which rise perhaps from the playground of the little boy Moses, whose home was in Memphis in the days when it was a great city.

This is one of many wonderful rides that the traveler takes from Cairo, and always he comes back to Cairo as to another world.

But it is not Cairo, even with the Pyramids, which most moves the traveler in Egypt. He is loth to leave it, glad to come back to it, and never for a moment lets the spell of it go. But Cairo, after all has been said, is of this world, and there are great cosmopolitan cities elsewhere. It is when he leaves the train, which brought him from Cairo, at Luxor, and wanders through the ruins of the great structures of another time, that the traveler feels that he is in another world. The vastness of the halls and temples, the size of the columns and statues awes his mind; the sadness of their ruin oppresses his spirit.

**THE RUINS OF AN ANCIENT CAPITAL**

A few miles farther on lie the ruins of Thebes. We wander through them in the warm Egyptian sunlight, and try to imagine how the city looked when the buildings stood as their builders had left them, and the colossal statues gazed down on throngs of worshippers. Thousands of years have come and gone since they were built; many centuries have passed since they were overthrown and buried beneath the desert sand. The descendants of the men who built them dig down to find their ruins, and as we listen to the thud of pickaxes, and watch the plodding workmen at their task, we can fancy ourselves back in those far-off days when swarms of workmen toiled to raise the giant walls.

We fling our guide-books down, for we care nothing for the height of columns, or the size of halls, as we remember that here sat Rameses, that here came Alexander, that here was the heart of the world in an age of which his mind cannot even think, that the stones rising to the sky were placed there by the greatest builders that the world has ever known, thousands of years before the foundation stones of the Capitol, at Washington, were laid.

Across the river lie the mountains where the kings of Thebes made their tombs, like which there is no other tomb on earth. Think of the most impressive place where the mortal remains of a king of men can be laid—of the heart of Livingstone, in his own Africa; of Cheops, in

## WHERE MOSES PLAYED AS A BOY



A desert oasis in which majestic palm trees look down upon mud houses.



The glory of the towering palms at Memphis, where Moses is said to have played.

## HOW THE GREAT TEMPLES WERE BURIED



### THE BEAUTIFUL TEMPLE HIDDEN IN THE EARTH FOR CENTURIES AT ESNEH

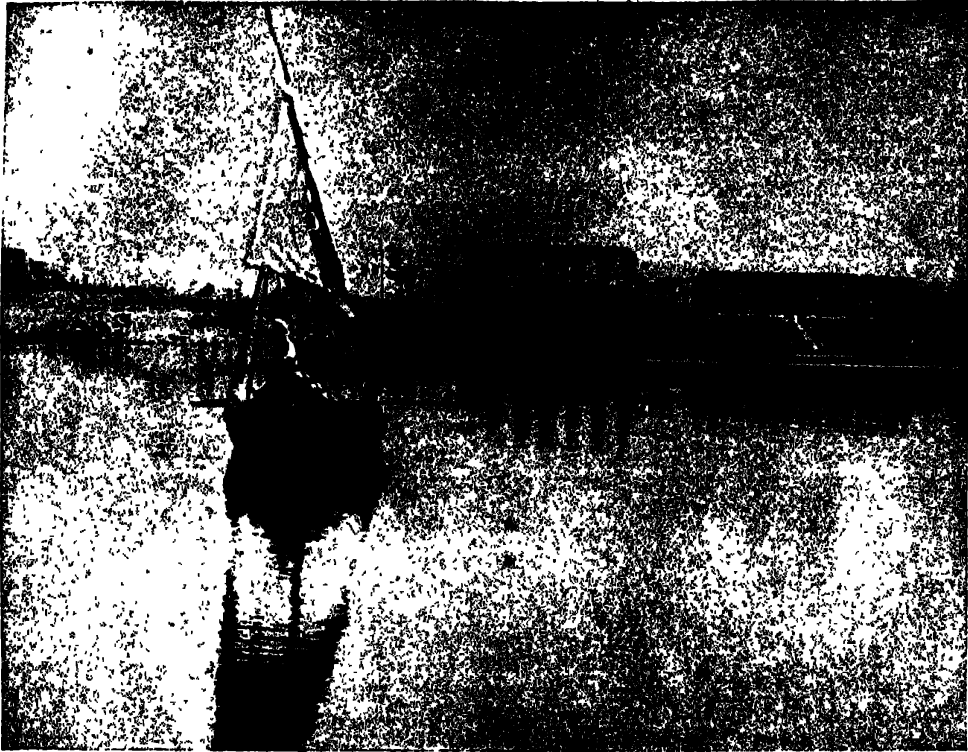
These pictures show how the temples of Egypt were buried in the earth and dug out again. The road outside the temple at the village of Esneh, on the Nile, is now level with the pathway seen at right of top picture, but when the temple was built the road must have been level with the floor, as below. Inside the temple has been excavated; outside is still covered by earth. The way in is down the steps.

THE MOUNTAINS IN WHICH THE KINGS OF EGYPT LAY FOR THOUSANDS OF YEARS



FOR CENTURIES THE KINGS OF EGYPT LAY HIDDEN FROM THE WORLD IN TOMBS CUT DEEP DOWN IN THESE MOUNTAIN MASSES. BY ONE DREAMING OF THE WONDERS HIDDEN HERE UNTIL A TOMB WAS PIERCED ONE DAY BY THE ACCIDENTAL BURST OF A PIPE.

## WHERE THE KINGS OF EGYPT LIVED



The Nile at Luxor, once known as Thebes, the seat of the empire of the Pharaohs.



The splendid columns of the ruined Temple of Luxor, as they stand to-day.

the terrible loneliness of his Great Pyramid; of Cecil Rhodes, at the summit of the mountain from which he looked down upon a continent; of Mohammed at Medina; or Napoleon; of Washington in his country home; of Nelson, of Wellington, in the heart of the empire that they helped to build.

**THE TOMB THREE THOUSAND YEARS OLD**

And none of these resting-places of immortal men can be likened, for an impressiveness that is overwhelming, for a great silence that can be felt, to the graves of the dead kings of Egypt.

Hundreds of feet deep in the mountains, through chambers cut in the solid rock, with sculptured walls bearing the history of his life, as rich in color as if the paint had dried upon them yesterday, Amenophis II. lies in his coffin as his people left him there three thousand years ago. In a smaller chamber, among the dust on the ground, lies a beautiful woman, her black hair falling over her shoulders, who played, we are sure, with the princes in the king's palace 1,500 years before Jesus Christ was born.

From Luxor we take boat to Assouan, to see the great Nile dam, and at Assouan our boat turns round and sets our faces homeward. Six hundred miles down the Nile is Cairo, and slowly down the great river we go. Here on the banks as we pass is Egypt at home. Here are the mud huts of to-day; here are the broken temples of yesterday.

In no other place in the world can so much change, so many varied scenes, so many aspects of life itself, so many types of people, such an endless transformation of human and natural things pass in so short a time. It is like a cinematograph, throwing upon a screen, all in an hour, every kind of life in every part of the world in any age that has ever been.

**THE VAST ETERNAL THROG THAT LIVES AND MOVES ON THE BANKS OF THE NILE**

We sit on donkeys or on camels, or on the sunny decks of steamers, or stand in mud houses, or lie under palm trees, or rest in great temples, or look out from trains, and see this great world move past—a vast, eternal throng. If you turn to your map of Egypt, you will find, lost on the banks of the Nile among sugar-canes and palm trees, a place called Edfou. We have just left it, climbing to the height of its great temple, tramp-

ing its dusty streets, and parching with thirst at the very sight of its mud town.

In the background from our boat stands the temple as the Ptolemies left it. A dusty lane leads from the landing-stage to the mud-built town, with the minaret outstanding to remind us that the things of this world pass away. Women and girls are coming with their water-pots, which they carry on their heads as they did when these temple walls were built.

**THE SIGHTS AND SOUNDS IN THE FIELDS OF EGYPT**

At the riverside a group of women are busy washing their robes, and spreading them out on the rocks to dry. Behind them stand a dozen donkeys, with donkey-boys and dragonmans, half a dozen boys asking for English books and one or two for backsheesh, and a motley crowd of folk—white, brown, and black—in black robes, white robes, and blue robes; in black turbans, white turbans, and blue turbans; and red fezzes.

In the shade of the hill sit four splendid Arabs. Over the hill come two camels, laden with stuff from the quarry where a dozen natives are excavating an ancient temple. In a moment the camels are lost in a cloud of dust, which comes and goes as if it were a speck in a hurricane, though the air is as calm as the Nile. Along the bank the shadoufs are working—the quaint and clumsy water-carrying instruments which still, as for thousands of years back, carry the waters of the Nile into the fields around. In these fields buffaloes are ploughing, sugar-cane is growing, palm trees rise in the distance; and beyond it all lies the range of mountains which never break.

As our boat leaves this stopping-place, an Egyptian gentleman, the Sheikh of his district, lands, amid the salaams of the people; the crew break out into the plaintive hymn which marks the setting off of every boat and its arrival; and our steamer looks ahead, to the sailing boats that look like poetry far up the placid Nile. And on, and on, and on we go, through the wheat-fields on one side and the desert on the other, with no sign of life save the naked men at the shadoufs, and now and then a mysterious figure in a flowing robe. It is as if all strife among men were dead, and peace and happiness for all had come.

CONTINUED ON PAGE 6221.



## HOW 100,000 SLAVES SET UP A MOUNTAIN IN THE SANDS



The modern world has gazed with amazement at the Pyramids of Egypt, and wondered how such gigantic monuments could have been built in the days of the world's childhood. But we are almost sure that they were built as shown in this picture. When the first stones had been fixed in their place a bank was made up to the top, sloping down to the level of the ground. Up this slope the next great stones were dragged, and when these had been fixed the slope was carried to the top of them. So, as the pyramid rose, the sloping way rose too, until it became a wonderful road for thousands of slaves to walk along, dragging the granite behind them. The road was greased to make the dragging of the stones easier, and behind each stone were slaves with levers to help. By the time the pyramid was finished, this roadway must have been miles long. When at last the pyramid stood complete, and the final stone had been placed on the top, the inclined plane was taken away. It took 100,000 men thirty years to build this Great Pyramid.

## The Book of STORIES



### THE UNKNOWN HERO

ON the banks of the Rhine, just above the little town of Caub, is the castle of Jutta's Rock. Jutta was the beautiful sister of Philip, the lord of Caub, and she was queen of the tournament at Cologne when the German heroes rode the lists and showed their courage before the eyes of their ladies. No knight, however, carried her colors, though many wished to win that honor. None had been able to touch her heart, but her brother hoped that one of her suitors would win her by some striking act of bravery in the tournament.

But, famous as the warriors of Germany were for horsemanship and strength of arm, none was able to distinguish himself that day. A tall knight, with an English device inscribed on his shield, bore down every warrior who entered the lists against him.

All the ladies were deeply interested in the strange knight, and when Jutta saw his eyes fixed on her, her heart began to beat. The stranger won the prize, and, to the great joy of Jutta, he reined in his warhorse by the place where she sat.

"I love you!" he said. "Trust me! Give me the glove you wear and I will return with it in three months."

"Cannot you stay?" said Jutta anxiously, giving him the glove.

"No, my dear lady," said the unknown knight. "I have come to Germany on a great enterprize,

and if I delay I shall fail."

He spurred on his horse and rode into the night. For three long months Lady Jutta hoped for her unknown hero's return, always refusing to let another knight carry her colors in the lists. Time passed, and still he did not come. Altogether for six months Jutta waited for news of her unknown lover. She heard that some English knights had been slain in a fight over the election of Richard of Cornwall as Emperor of Germany.

"He must have fallen in the fray," she kept saying, as the days went by. And at last she shut herself in her room, and refused to see anybody.

One afternoon the Emperor of Germany called to claim her hand in marriage. Jutta returned word through her brother that she had resolved to retire to a convent. But the emperor insisted that she should see him, and Jutta came slowly into the hall.

"Jutta," said the emperor, handing her a little white glove, "have you forgotten the poor English knight?"

The emperor raised his visor, and, with a cry of gladness, Jutta ran into his arms. Her hero was Richard of Cornwall, brother to King Henry III. of England! After a long struggle he had been crowned Emperor of Germany. He now came to share his high honors with the maiden whose heart he had won as an unknown knight, and Jutta was made Empress of Germany.

## THE FIGHT WITH THE DRAGON

As the young knight rode through the streets of Rhodes, thousands of voices sang his praise. For behind him he dragged the lifeless body of the dreadful monster that had filled the land with terror and dismay.

"Open the gates," cried the crowd, leading the young knight to the monastery of the military monks called the Hospitallers of St. John. "He has killed the dragon!"

The gates were flung open, and the people followed the hero into the council chamber, where the Grand Master of the Hospitallers was sitting with the other officers of the Order.

"What is the meaning of this?" said the Grand Master, in a stern voice.

"I have killed the monster that made its den in the Chapel of the Three Kings of Cologne, and prevented pilgrims from visiting it," said the knight.

"My son," replied the Grand Master, still more sternly, "you have done great wrong. After five of our bravest knights lost their lives in trying to kill this dragon, I forbade any man of our Order to attempt the feat that you have rashly undertaken. You have disregarded my orders. Speak! What is the first duty of a knight of St. John?"

"Obedience," said the young Hospitaller, bowing his head with shame at the unexpected rebuke.

"You are a professed champion of our Lord, wearing the emblem of the Cross," exclaimed the Grand Master. "You have broken the law of your Order wilfully and rashly, and —"

"Not rashly, my father," interrupted the young knight. "Hear my story. I went to a craftsman of my native town, and got him to make a life-sized image of the dragon. This I placed in a field, and trained my horse to approach it, and taught my dogs to attack it only where its skin was thin and tender. I journeyed back to the chapel, and, finding that the monster was sallying out of its den and slaying and terrifying the country people, I resolved to fight it at once."

"You should have first asked leave," said the Grand Master.

"There was no time," replied the young knight. "Men were being killed every day. None could stand against

it. Formerly it had only come out at night, but now the terrible monster was grown so bold that at noon-day he feared not to attack the peasants in the fields. I found the dragon sunning itself on the ground beside the chapel, and set my dogs on it. Then I charged at the monster, and tried to pierce its body with my spear. But the weapon broke against its scaly hide. Then I attacked the angry dragon with my sword. This, too, broke in my hand, and I was thrown to the ground, and the horrible beast opened its jaws to devour me. But my dogs attacked the monster where the skin was unprotected by scales. Roaring with pain, the dragon turned from me and tried to drive away the dogs. Then I drove my broken sword up to the hilt in its body, and it fell to the ground, slain."

Moved by the young knight's story, the crowd made the council chamber ring with their applause. Even the Hospitallers were won by the modest air with which he related his wonderful achievement, and they begged that he should be given the crown of valor. But as the people were carrying the young knight in triumph through the hall, the Grand Master called for silence, and said:

"You have become the enemy of your Order. Take that holy cross from your breast, for you are no longer worthy of wearing it. It is the emblem of the spirit of Christian humility and obedience. You have slain the dragon in order to win idle glory, and a more terrible monster now lodges in your proud breast—the serpent of self-will, disobedience, and worldly pride."

The crowd raised a cry of protest, but the dragon-killer meekly obeyed his angry superior. Silently, and with downcast eyes, he took off the dress of his glorious Order, stooped and kissed the hand of the Grand Master, and slowly and sadly walked away with bowed head.

But as he reached the door the Grand Master called him back.

"Come, my son," he cried; "you have now won a harder battle than your fight with the dragon, for you have conquered yourself. Take back the Cross of the Hospitaller Knights. You have gained it by heroic meekness of soul!"

## THE SONG THAT FOUND A KING



HOW BLONDEL, THE WANDERING MINSTREL, SANG OUTSIDE THE CASTLES OF EUROPE TO FIND HIS FRIEND THE KING

HAVING collected a debt that was owing to him at Durenstein, Black Hans, the moneylender, set out home in a state of wild alarm.

"Whatever shall I do," he muttered, "if those vile Crusaders attack me?"

The great Crusade in which King Richard of England had taken part had failed. Richard had strangely disappeared, and Europe was covered with fierce adventurers returning ragged, hungry, and penniless from the Holy Land. Travel had become dangerous, for one never knew when some broken soldier would spring out from under a bush and demand food or money at the point of the sword. This was why Black Hans looked uneasily around as he tramped along the high, rocky banks of the Danube. When a tree rustled his heart beat violently.

Suddenly a strange, wild figure came running towards him. Black Hans trembled as he drew his sword; but the

beggar laughed, and, approaching closer, held out his weapon for him to look at. It was only a simple lute such as minstrels used in those days to sing to.

The man himself was tall and young and handsome, with long, fair hair; but his cheeks were lean and worn, and his dress was a flutter of rags.

"My good sir," he said, taking off his cap with an air which would have been dignified in a lord, but was ridiculous in him, "I do not want to fight you or beg from you. At least," he added, "I only want to beg a little information. That will cost you nothing. Is there a castle near by where I could get food and lodging in return for a display of the gay science?"

"The gay science?" exclaimed Black Hans, looking at the miserable figure before him. "What is that?"

"Oh, you boors! You ignorant German boors!" cried the ragged minstrel angrily. "The gay science is the name of the new sweet poetry invented in sunny Provence. Have you never heard of Richard, the poet-king of England, who has made the gay science known from London to Palestine?"

"What about Richard of England?" said the moneylender suspiciously. "Are you looking for him?"

"What has a beggar like me in common with a king of England?" said the minstrel, with a laugh. "I am looking for food and lodging, my friend. Am I likely to get them about here?"

"Well, there's the Castle of Durenstein about a league up the river," said Black Hans sullenly. "But I doubt," he added, as he moved rapidly away, "if they want any of your new French fashions of singing and playing."

When the moneylender was out of sight, the minstrel threw his lute away and flung himself on the ground, under a tree, and covered his face in his hands and wept bitterly.

"My search is all in vain!" he moaned. "Richard, my Richard, I would give my life to find you and help to set you free! But it is impossible! You must have been shipwrecked on your way from Palestine, and the tale about a secret prison is a false report made by your foes to hurt your friends and waste their lives."

For a long time Blondel lay flat on

the ground, choking with sobs. He was a young knight of Picardy, who, like many other great lords of his time, had taken to the pleasant life of a high-born minstrel. In a tournament of song in Southern France he had met Richard, and won from him the prize for singing; and, instead of disliking Blondel for excelling him, the brave and large-hearted King of England had given him lands and made him his companion. They had lived together, composing songs in the new fashion and setting them to music and singing them to one another.

As Blondel met with an accident, he could not go with Richard to fight with him in the Holy Land; but when a rumor spread in Europe that the king had been captured and secretly imprisoned on his way back to England, the brave minstrel-knight resolved to venture his life in finding where his king was hidden.

"It's no use crying and moaning," he said at last, rising up and looking about for his lute. "Tears will not find his prison or unlock the gate. And, first of all, I must get some food, for I am well-nigh starved to death."

He had been wandering a long time since he set out from Picardy on his search, dressed in his brightest and gayest robes. Now his shoes were worn from his feet, and his fine attire was torn into tatters. In his own country the minstrel was always an honored guest, and had his seat at the lord's table and the best of food and lodging. Now as he went on he found that instead of being received honorably in the great halls of the castles as a minstrel-knight, he had to sink into kitchens, where his songs usually won for him a supper and a bed.

Walking along the narrow gorges through which the Danube foamed and roared, he came into the wide plain of Vienna.

There, where the great river widened, was the Castle of Durenstein, rising from the top of a hill and surrounded by a wall of rugged rocks. At the foot, by the bank of the river, was a little village. Blondel had enough money to buy some wine and bread at the inn in the village; then, refreshed by his meal, he wandered for some time around

## THE SONG THAT FOUND A KING

the castle singing at the top of his voice.

In a low, dimly-lighted room in the castle-keep a tall, powerful man, with a finely-cut face and a head of auburn hair, was restlessly pacing up and down the room, talking passionately to himself.

"Two years! Two years!" he was saying bitterly. "And not a single man in all my dominions has tried to set me free! I shall go mad if I think much more about it. There's John, my

"Let me try my hand at the gay science again!"

He walked up and down his prison-cell, turning over phrases and fitting in rhymes, and at last he took up his lute and began to sing softly to himself these lines, which are still remembered as King Richard's:

Know, men of England, Anjou, and Tou-  
raine,  
And all my knights with noble hearts and  
brave,



The Castle of Durenstein, where King Richard was imprisoned, as it appears to-day.

brother, and the Earl of Northumberland, and Longchamp and Pusey, whom I have loaded with honors and riches. Philip of France, too, who swore when he left Palestine that he would be my friend. They must know that the Duke of Austria is keeping me a prisoner against all the laws of God and man merely to obtain money. But will they give a penny to ransom me? Not they! They have got hold of my kingdom, and they mean to keep it, and they will let me die here like a rat in a hole."

For several minutes he looked moodily out of the narrow slit in the huge walls that served him as a window. Then on a sudden he laughed aloud, and said:

Your friendship, love, and duty now are vain  
To free me from the bondage of a slave

Remote from consolation here I lie,  
The wretched captive of a powerful foe,  
And here in grief I languish till I die -  
Die, and am buried where no man shall  
know!

"That's a very good beginning," said Richard, recovering his gaiety. "I've learned a good deal about verse-making this year. If ever I should meet Blondel I do not think he will excel me again. Poor Blondel! I wonder what he is doing. Making love-songs for the fair ladies in Picardy, perhaps, but probably forgetting that he had ever a friend called Richard."

A fit of sadness again overcame the

imprisoned king, and he went to the narrow window slit and stared sorrowfully at the open country.

Suddenly he reeled back as though he had been struck.

Someone was singing below, someone he knew, and the sweet voice pierced his heart. Nearer and nearer it came, as the singer, clambering round the outer wall of the castle, gradually approached the narrow window of his room, where the king listened like a man in a dream.

The words of the song came clear and ringing on the evening air :

If you were housed in a hut in the vale,  
And I were lodged on a hill on high,  
Would you sing to me as the nightingale  
Sings from a bush to a star in the sky ?

It was the first verse of a song which Richard and Blondel had composed together many years before. None but these two knew of it, and Blondel was singing it to help him to find his king. He had sung it outside hundreds of castles, in the hope that the king would hear him and would sing back the second verse.

And now, when the minstrel had given up all hope, and was sitting beneath the castle wall, his eyes wet with tears, someone from a window above began

to sing in a strong voice that shook with emotion :

If I were housed on a hill on high,  
And you were lodged in a lowland pass,  
I would sing to you as a lark in the sky  
Sings to his love in her nest in the grass.

It was the second verse of the song which only the king knew ! After all his efforts Blondel had at last found his king. Here in this castle he was imprisoned.

Leaping up with joy at his discovery, the minstrel sang the first verse again, to let the king know that he was still there listening. Then, careless whether he got a lodging for the night or not, he left Durenstein, and hastened through the darkness along the path which led for hundreds of miles across Europe to the English Channel. At night he slept on the rocky ground, and shivered in his rags. By day, stopping only to gather such roots and wild fruits as would stay his hunger, he pushed on through the forest.

It was months before he reached England, but when he arrived there he sought out William Longchamp, the Lord Chancellor, who was still faithful to Richard, and in 1194 Richard of the Lion's Heart landed at the little English port of Sandwich a free man through the efforts of Blondel.

## THE KING'S THREE QUESTIONS

FREDERICK II, known as "the Great," King of Prussia, throughout his reign took the greatest interest in the improvement of the Prussian army. For the guidance of his generals he wrote a number of works covering the whole science of war, and he was very fond of his guards, and knew every one of the men personally.

Whenever he saw a new recruit, he used to call him from the ranks and ask him three questions : How old are you ? How long have you been in my service ? Are you satisfied with your pay and treatment ?

One day a young Frenchman joined the regiment, and as he did not know any German, he was taught the answers to the king's three questions in the order in which they always had to be given.

Not long after, Frederick caught sight of the young man but, unfortunately, on

this occasion he did not ask the questions in their usual order.

"How long have you been in my service ?" asked the king.

"Twenty-one years," replied the Frenchman.

"Twenty-one years !" said the king. "Then you must be very much older than you look. How old are you ?"

"One year," answered the soldier.

"Upon my word," cried Frederick, "one or other of us must be mad."

"Both," said the soldier, who had been taught that this was the proper answer to give to the king's third question.

The king, of course, flew into a great rage, and the poor recruit then explained the whole matter in French, a language that the king understood perfectly. Frederick laughed heartily, and advised the soldier in future to speak only a language he knew.

CONTINUED ON PAGE 6283.

# The Book of FAMILIAR THINGS

## WHAT THIS STORY TELLS US

**N**O invention of our day means more to people who live in cities than the high-speed elevator. Without it our large cities would not be possible. If all the people who now live in New York or Chicago were forced to occupy buildings so low that the stairs could be climbed easily, the cities would necessarily be spread out over enormous spaces. Offices and homes would be so far apart that men could not do business as they do to-day. The modern elevator carries us swiftly, safely, and almost noiselessly, up and down, ten, twenty or thirty stories, and few give a thought to the wonderful machinery which helps us so much. We tell you in this story how the ordinary electric elevator works, and show you also a very common elevator which is worked by the power of water. Both are safe and swift. When you have read this story, you will be able to tell them apart, and to understand the machinery which moves them.

## HOW ELEVATORS GO UP AND DOWN

**T**HOSE of you who live in a large city take the tall buildings, ten, twenty, thirty, or even more stories high, as a matter of course. If you have never seen the buildings themselves, you have seen pictures of them, and may have wondered how people can be found to fill them.

You have already been told in our book of the method of building, that the framework is of steel and supports the walls. Without this kind of construction, such buildings would not be built at all. If the whole of the great weight rested upon the walls, it would be necessary to make them so thick at the bottom that most of the lower stories would be a mass of stone, without any room for offices or shops. The walls could be made thinner toward the top, of course, but much space would be wasted.

But even when these high buildings are built they could not be used but for another modern invention. In some of them thousands of men and women work, the population of a town sometimes. How do they get to their offices so high up in the air? Only very strong and very active persons could climb twenty flights of stairs several times a day.

### **T**HE ELEVATOR MAKES THE HIGH BUILDINGS POSSIBLE

Go into one of these buildings and you will see, behind iron or glass doors,

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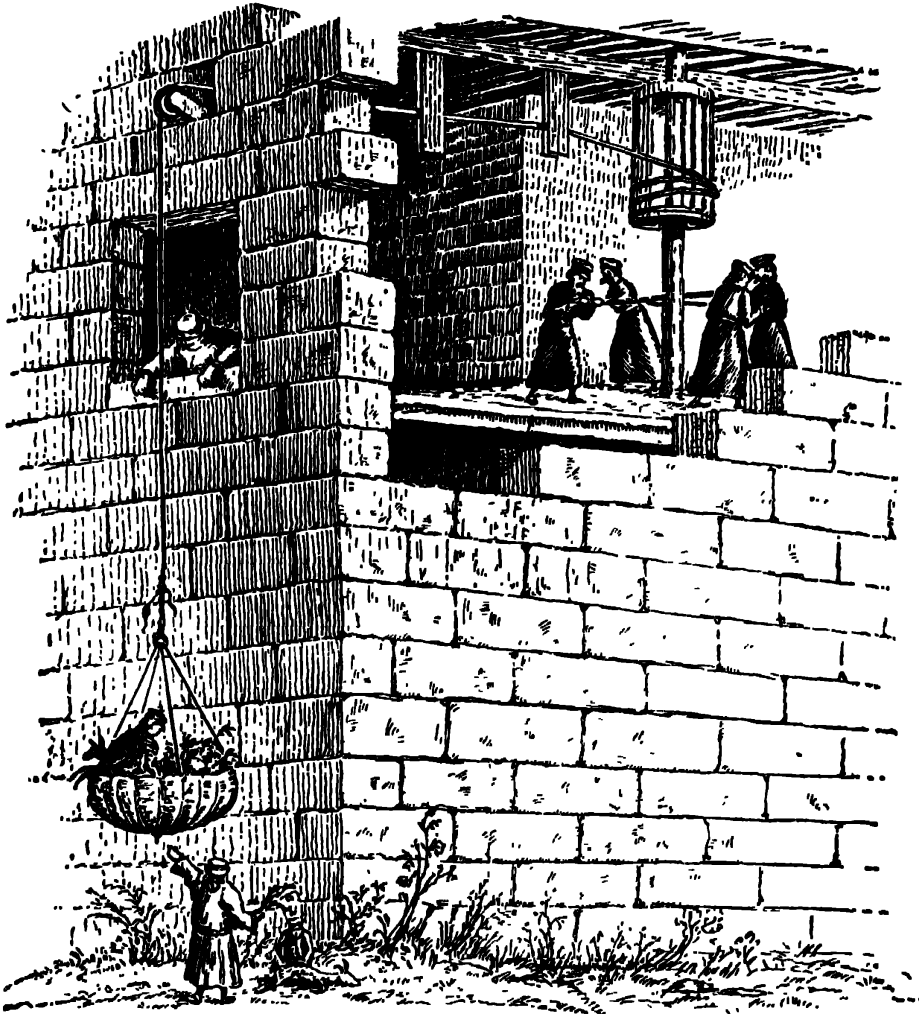
one, two, a dozen, or perhaps more elevators, depending upon the size and height of the building. A door is slid back, and you step into the car with other people, sometimes as many as twenty, the door slides shut, a lever is pushed, and up you go like an arrow. You are carried straight up, the length of a city block, in much less time than it would take you to walk that distance on the pavement. The doors are opened, you step out, and the car goes on, or else returns to the first floor.

Such is the modern high-speed electric elevator. But it was not always like this. From very early times men have felt the need of some sort of a machine to lift themselves or goods. In our first picture you see an early form of lifting machine. During the Middle Ages, as you have been told, there was little law and order in the world. The motto of the time was: "Let him get who hath the power, and let him keep who can." Robbery was a common profession then. Here you see a corner of an old monastery, which had no entrance on the level of the ground. Provisions and visitors were hoisted in the basket. Elevators of this sort are still in use, though not often to raise passengers. The bucket and windlass at the well really make a sort of elevator, though we do not think of them as such.



After the steam engine was invented, elevators were raised by winding the rope upon a cylinder. You may have seen one working upon this principle, loading or unloading a boat, raising dirt from the foundation of a house, or lifting building material high in the air. Though they

and many of them are in use at the present time. One type is the plunger elevator, which is one of the safest kinds. A strong iron pipe is sunk into the ground, as deep as the building is high. A strong iron cylinder, which fits tightly, but smoothly, is placed in the the large pipe



This picture was drawn from an old print which showed how some monks in an old monastery got in or out of their home. There was no entrance on the ground floor for fear of robbers, but monks, visitors and provisions were hoisted up to the opening above. Of course the wall nearest us was solid

have no car, they work in the same way. These were not very satisfactory, for a man had to be employed to run the engine and another to look after the car.

#### THE POWER OF WATER IS USED TO RUN ELEVATORS

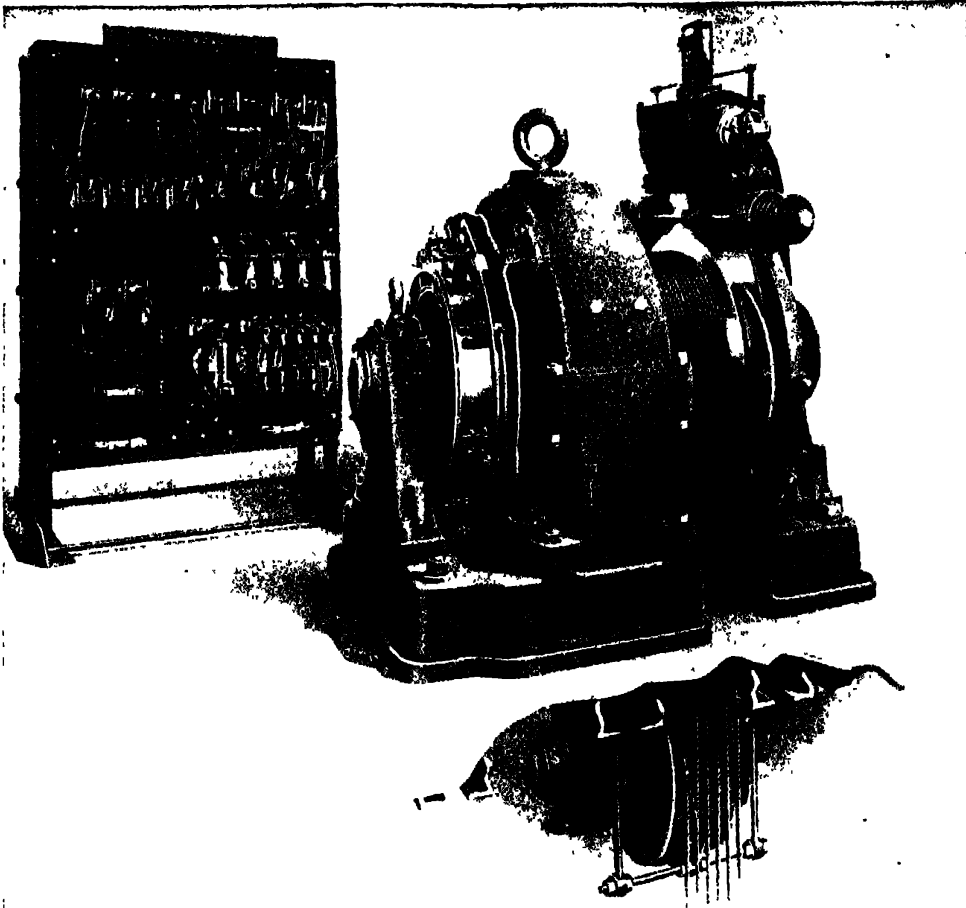
Men had learned the power of water by this time, and we soon see that use was made of it to lift passengers. The hydraulic elevator was soon improved,

and the car is fastened on the top. In the pipe are two openings, one to let water in, the other to let it out. Now, if water, which has been compressed by a powerful pump, is let into the pipe, it will force up cylinder, car and passengers. When the car has gone as high as is desired, the water is cut off, and the car ceases to rise. When the operator wishes to descend, he opens the outlet

## HOW ELEVATORS GO UP AND DOWN

pipe, and as the water escapes the car sinks. All this is done from the car itself. You will see elevators of this kind in many buildings which are not very tall, such as department stores. They are very safe, for they cannot fall unless the pipe should burst, and then the water

rather hard to describe, but perhaps you can understand if you study the picture carefully. In all of these cars you will notice heavy weights hung in the shafts outside the cars. These are made to weigh almost the same as the cars, so that they would almost balance if the



This is the motor, the sheave and the brake which controls an electric elevator. The motor on the left turns the sheave in either direction as the operator decides. The brake helps to check the car, and the wire ropes support it. The idler sheave, around which the ropes run, is underneath the floor. The switchboard, behind, controls all the elevators in the building.

Pictures by courtesy of the Otis Elevator Company

could not escape very rapidly. When the pipe does not go through rock it is often surrounded by cement.

There is another type of hydraulic elevator which is more used than this. It has a cylinder and a plunger, too, but the plunger is connected with the wheels over which the rope goes, and is so arranged that when it moves a few feet it makes the car move many feet. This

cars were let loose. The power, then, no matter what it is, has only to lift the load, and not the heavy weight of the car.

### **E**LECTRICITY NOW USED MORE THAN ANYTHING ELSE

Most elevators, nowadays, are run by electricity, and are of two kinds. One has a drum, or windlass, which is run by an electric motor. The rope which lifts the car is wound around this drum. This

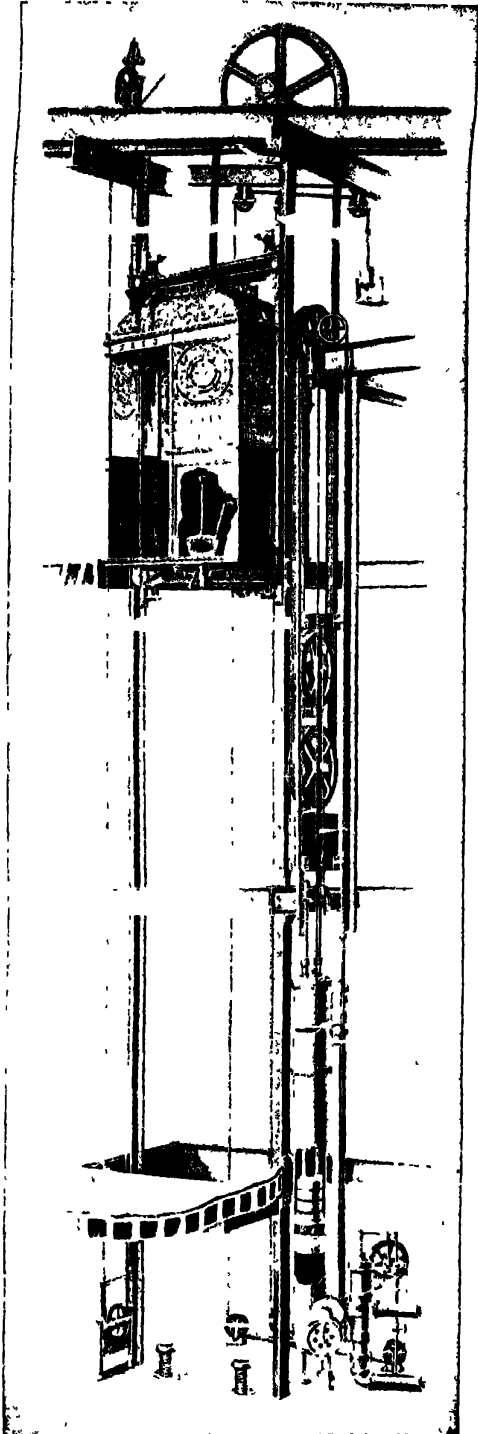
kind cannot be used very well in a very high building, for the machinery would take a great deal of room.

Therefore, advantage has been taken of the fact of friction. The rope is run over a pulley, called a "sheave," then over another and then over the first again, making a complete loop. A rope would like this cannot slip, for the greater the weight, the tighter the rope clings. One end of the rope is attached to the car and the other to the counter weight. The electric motor turns the sheave, and the rope passing over this and the second or "idler sheave" raises the car. The motor will turn the sheave just as rapidly in the opposite direction. The brake is on the other side of the main sheave. A switch in the car enables the elevator man to go up or down, slowly or rapidly, or to stop at once.

#### WHAT WOULD HAPPEN IF THE ROPE BROKE

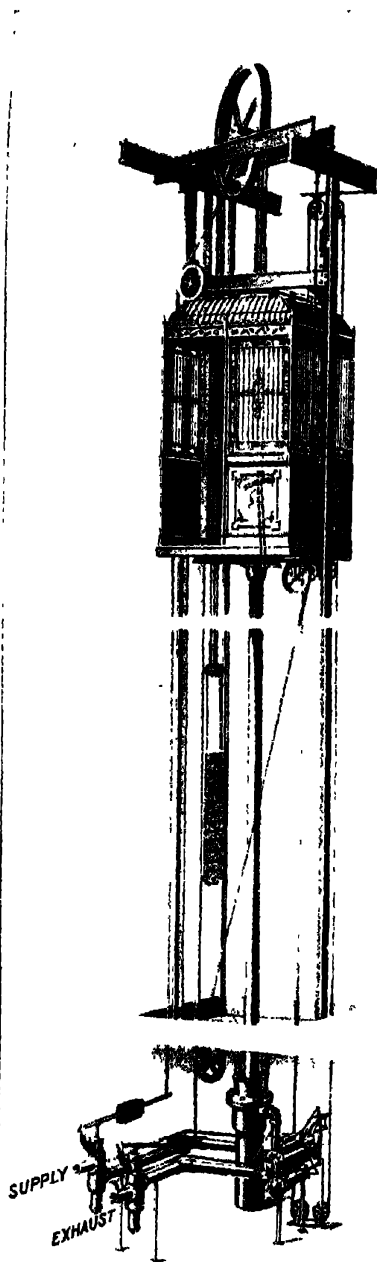
What if one of these cars should fall? This does not often happen. In the first place, though one wire rope is enough to sustain the weight, very often as many as six are used. It is almost impossible for all of them to break at once. Then, too, the brakes are set to hold the car if the power is cut off. There are still other things which help to make the car safe. On the bottom of the car are powerful steel jaws, which catch the rails between which the car runs if it begins to run too fast. These devices would seem to be almost enough, but the makers of elevators have invented something else. At the bottom of the shaft are two oil cushion buffers. If the car should strike them, the oil would be forced slowly into other chambers, and the shock would be broken, just as when you jump upon a feather bed. Sometimes the bottom of the shaft is made very tight, and the car fits closely. Then if the car comes down rapidly, the air cannot get out, but is gradually compressed and pushes back against the bottom of the car. Once a test was made to see what would happen. Everything which would stop the car was removed and it was allowed to fall. It dropped like lightning at first, but as it drew near the bottom it began to go more and more slowly, until finally it reached the bottom without breaking a single one of a basket of eggs which had been left on the bottom of the car.

THE NEXT STORY OF FAMILIAR THINGS IS ON PAGE 6203

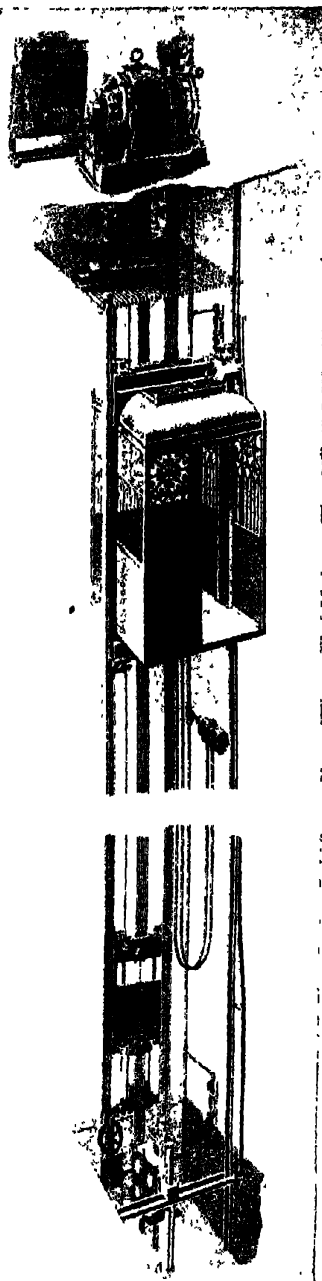


This is a common type of hydraulic elevator. The piston or plunger works in the tank of water, and as it is pushed out or drawn in, raises or lowers the car. A part of the side of the tank is removed so that you can see the piston. The rope is run several times around the pulleys, so that when they move a foot the car moves several.

## TWO TYPES OF PASSENGER ELEVATORS

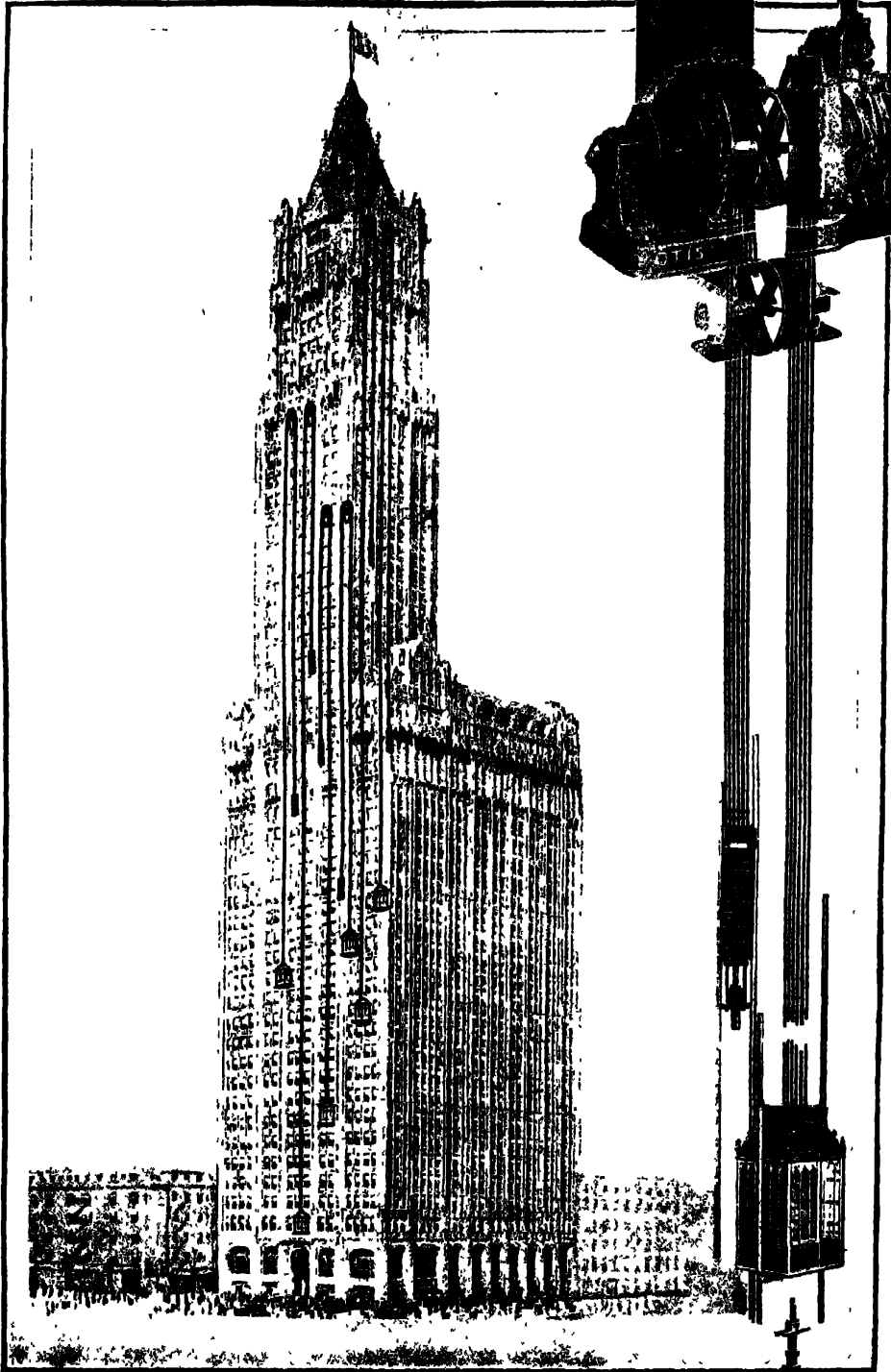


This hydraulic elevator is pushed up by the pressure of water which is forced into the pipe in which the plunger at the bottom of the car's sides. When the water is allowed to run out the car descends. The iron pipe must be as far in the ground as the building is high. The break across the machinery means that we cannot show the whole height.



The high-speed electric elevator is run by the tiny electric motor at the top, which turns the sheaves in either direction, or stops, according to the position of the tiny switch near the door of the car. The distance from the bottom to the top of an elevator shaft like this may be several hundred feet. We show you here only the top and the bottom.

## ELEVATORS IN A HIGH BUILDING



This shows the elevators which run in the tower of the Woolworth Building in New York City. Since the number of people on the top floors is not large, not all the elevators run to the very top. The small elevator highest up, carries people from the top floor to the platform near the top of the tower. These are only a few of the twenty-six elevators in this building. Some buildings have even more.

## The Book of FAMILIAR THINGS



Young Sailors Learning to Tie Knots at the Pelham Bay Station

### SHIPS AND SAILORS OF OUR NAVY

IN another part of our book we have told you some of the stories of the United States Navy while it was small and weak. There are many other stories of bravery and skill which we did not tell, but we cannot find space for them all. They would entirely fill our book. Now we shall talk a little about our navy to-day, when it is one of the largest and strongest in the world.

The ships in which Perry, Decatur, Hull and the rest fought were sailing vessels built of wood. They carried a great many guns, more than the largest battleships do now, but these guns were small, did not carry far, and were not very accurate. One of the smaller battleships of to-day would destroy any number of the best wooden ships of the War of 1812. They could hardly get near enough to fire a shot, and if by chance they did, they could not do much harm.

#### THE FIRST BATTLE OF IRON SHIPS IN THE WORLD

You have read of the battle between the Merrimac and the Monitor in the Book of the United States. This was the first battle of iron ships in the world, and soon all the nations were building them. From this small beginning have come all the mighty battleships which cost so much money and can do so much harm.

Though the United States had a

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large fleet during the Civil War, after the war was ended the people wanted peace so much that the navy was neglected. It was thought that no foreign power would interfere with the United States, and the old wooden ships were allowed to rot. It had been found that vessels like the Monitor were not safe in a storm and few of them were built. For a time the United States did not have a single armored ship.

Men began to see that the United States would be helpless if attacked, and in 1883, Congress ordered four armored ships. Four more were ordered in 1885, and more ships were ordered every year after this. In 1890 Congress ordered three large battleships. Others were built later, and the work of the navy in the War with Spain convinced the country that we must have many more ships.

#### THE DIFFERENT KINDS OF SHIPS IN A NAVY

There are many kinds of ships in a first-class navy, used for different purposes. We often speak of the great gray battleships as if they were all. These battleships are very important, and they cost more than all the others together, but in any navy they are few, compared with the whole number. Besides the battleships there are usually cruisers of several kinds, scout ships, gunboats, destroyers, torpedo boats,

submarines and submarine chasers, flying-boats, colliers, supply ships, hospital ships, and others.

Let us look at the United States Navy. First to be mentioned are the battleships. We had thirty-six of these at the beginning of 1917, and there are probably several more now, for the government has been building steadily for years. Some of these are old, and some are new. The newest ones are the most powerful, for they carry either more guns or else heavier ones. Such ships are several hundred feet long, and have very powerful engines which give all the newer ships a speed of twenty knots an hour, or more. The ship is protected above the water line by heavy plates of hardened steel, twelve inches or more thick. They have eight to twelve big guns, and a large number of smaller ones.

One of these great ships costs at least \$10,000,000, and some of them cost much more. It costs thousands of dollars to fire its big guns. It carries a crew of several hundred men. Ships differ so much that it is hard to give exact figures which will be true for all of them. The battleships are named for the states of the Union, as Wyoming, New York, and Oklahoma.

Next come the cruisers. There are several kinds of them. Generally we can say that a cruiser has lighter armor and fewer guns than a battleship, but greater speed. The idea is to have a ship which can get to the point of danger quickly and will still have power enough to do damage to the enemy. Some of the cruisers are named for states, but generally they are called for cities, as St. Louis, Milwaukee and Charleston.

#### THE SWIFT DESTROYERS WHICH PATROL THE SEAS

One of the most important ships is called the destroyer, and got the name in a peculiar way. Years ago, when the torpedo first came into common use, small ships were built which fired torpedoes from the deck. Larger ships were built to fight the torpedo boats and were called torpedo boat destroyers. They carried torpedo tubes, and rapid fire guns also. They were so much superior to the torpedo boats that few of the latter are built now, but every navy has many destroyers.

The destroyers have no armor, but do have great speed. Some of them can make over thirty knots an hour. They

are armed with three or four-inch guns, and carry torpedo tubes. They run errands, protect merchant vessels and look for mines and submarines. If they get the opportunity their torpedoes will sink a battleship. Their guns will smash a submarine, and if it submerges, they will drop a depth bomb into the water where it went down, or where they think it has gone. The depth bomb is a steel case containing explosives, which can be set to explode at any depth desired. As you know the pressure of water increases with the depth, and since experiments have shown the difference the bomb is set to explode at a certain pressure. This bomb may destroy a submarine even if it explodes some distance from it. The United States destroyers are named for the naval heroes, as Porter, Sampson and Cushing.

We have already told you about torpedo boats. Now we come to the patrol boats, or submarine chasers. They are really scout boats, and can do good work against the old-fashioned submarines. The newer submarines carry guns on their decks, which are sometimes heavier than those of the patrol boat, however, and could easily destroy it. But the patrol boats can be of much service in many ways.

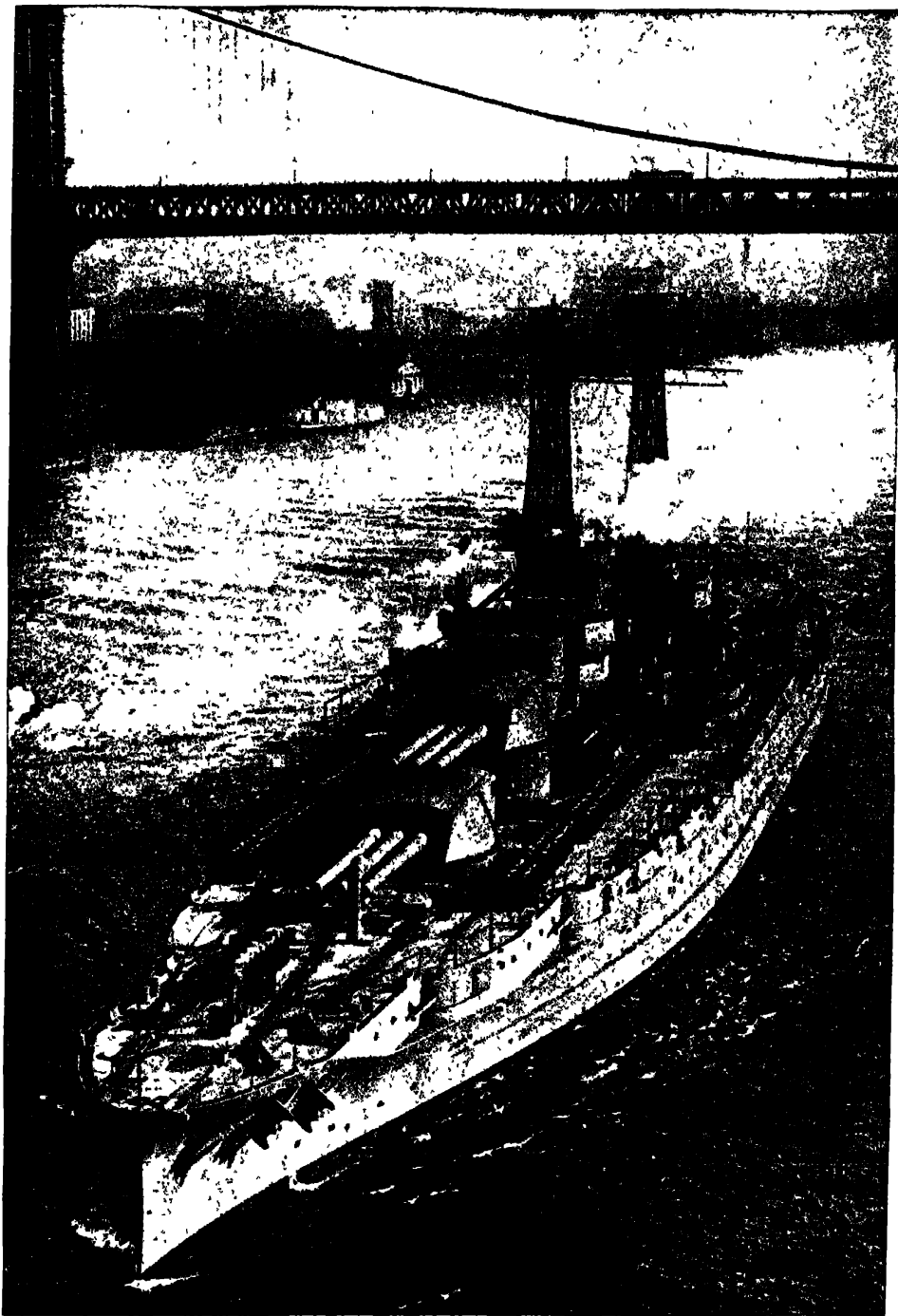
We have told of the submarines and of the flying-boats in other stories in our book, and cannot tell more of them here. Every first-class navy must have both.

A battleship uses a great deal of coal, but does not have much room to carry it. So we have colliers which carry many tons, and meet the battleships at some place agreed upon, or else stay with the fleet except when a fight is expected. Formerly ships were coaled by taking on coal in small bags, but the new colliers use derricks and scoops. Some of the battleships burn oil, and for them there are oil ships.

There is not much room for wounded on a warship of any sort, and they can not be looked after very well. So hospital ships are fitted up, to take care of the wounded from the fleet. Some of them have every convenience that a good hospital would have.

Besides these which we have mentioned, many vessels are needed in a well equipped navy. It must have tugs, supply ships, and often a vessel is fitted up as a workshop, where repairs too difficult to be made on a fighting ship may be

## ONE OF THE MOST POWERFUL BATTLESHIPS



The United States ship Arizona carries twelve 14-inch guns, and twenty-two 5-inch as a secondary battery, besides four torpedo tubes. The shells of the great guns weigh 1,400 pounds. The horse-power is 32,000 and it was designed to make twenty-one knots an hour. It is said that some of the ships now building will carry 16-inch guns, which will throw a shell weighing 2,100 pounds a distance of twenty-two miles. There are six other vessels in the United States Navy of about the same power as the Arizona. We show some pictures of a sister ship, the Pennsylvania, including the heavy guns, which are so formidable. Pictures on pages 6205, 6208, 6209 from Brown Bros.



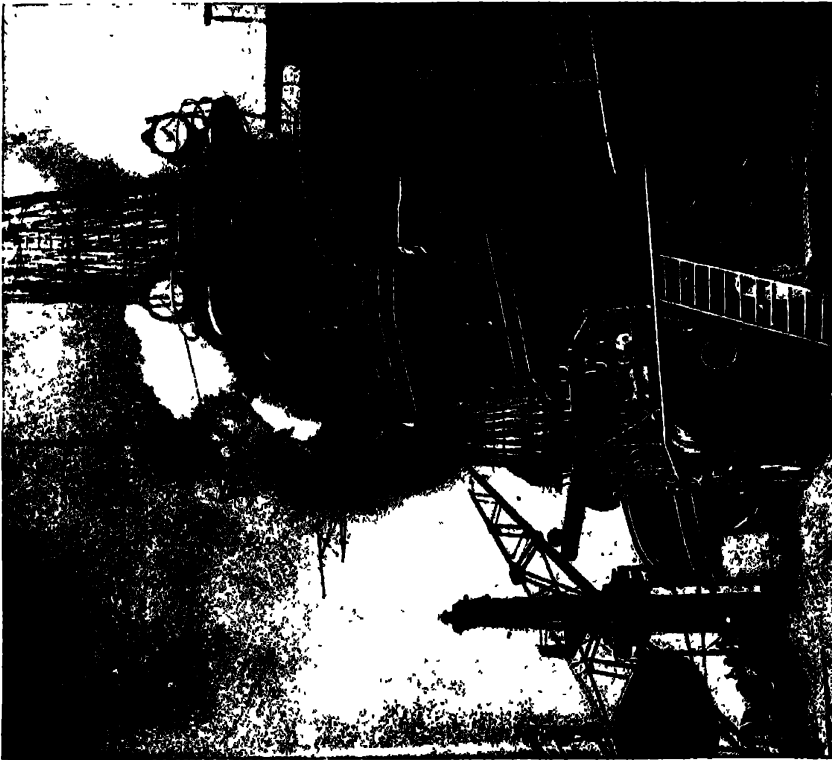
## A LATTICE MAST ON A BATTLESHIP



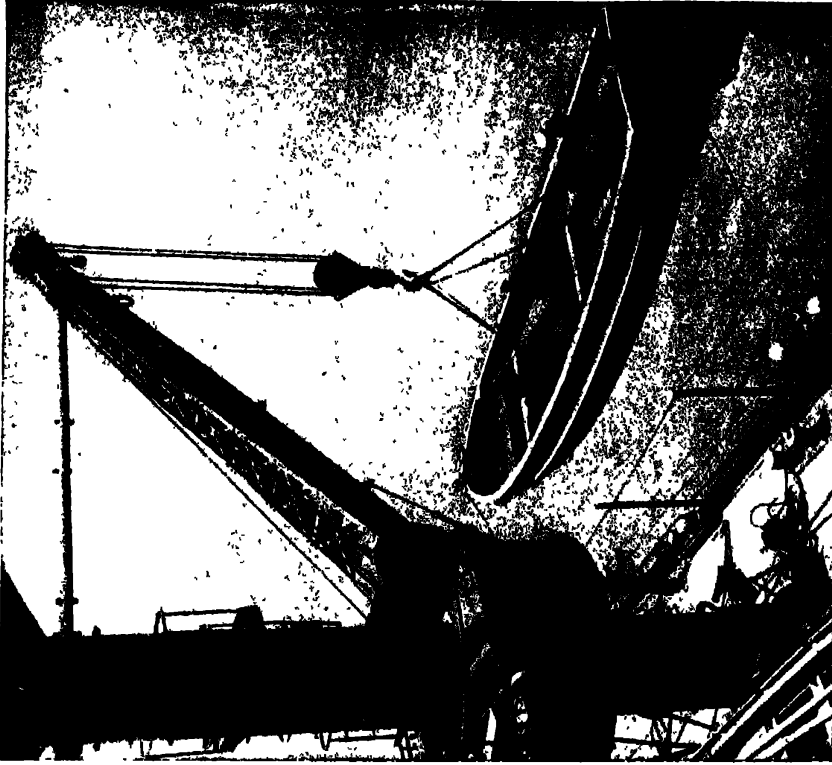
The United States battleships have these peculiar masts, made of rods of steel bound together, which are seen upon those of no other nation. Ladders inside enable the sailors to climb to the lookout or to repair the wireless and do many other things. Note the two enormous searchlights near the bottom of the picture. They can make the spot upon which they are turned as bright as day.

Pictures on pages 6206, 6207, 6212, 6213, 6214, copyright by Underwood & Underwood, N. Y.

## THE GREAT BATTLESHIP IS PREPARING TO DEPART



The Pennsylvania is getting up steam, preparing to depart. The engines are so large that this cannot be done all at once. Here you see the small boats stacked on the deck and one is hanging on the left. This is about the centre of the boat.

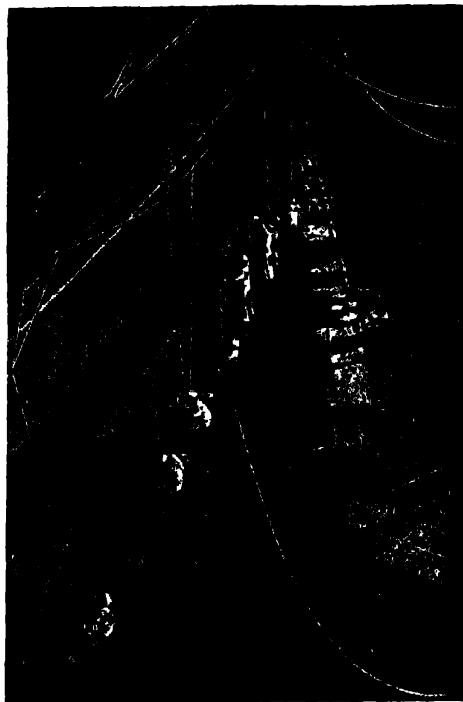


You see here a closer view of the derrick, which is lowering the tender into the water. It has been swung from its position on the deck and swung out over the water. A modern battleship is a very expensive mass of exceedingly complicated machinery.

## FOES AND FRIENDS OF THE SUBMARINES



During the Great War the United States built a great number of swift wooden boats for use against the submarine. They carried a small crew, a light gun, and a machine gun. Steel boats were built also.

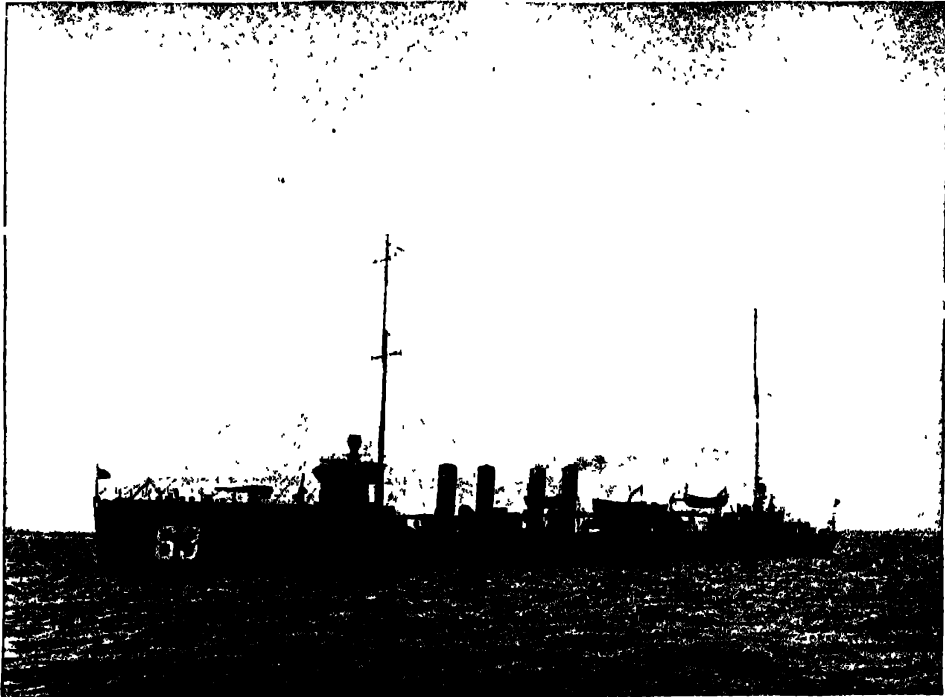


Sailors are here shown painting the sides of the immense Pennsylvania. This was done before she was finished, but battleships are often painted. Copyright by Underwood & Underwood, New York.



Here is a "mother ship" with two United States submarines lying beside her. The mother ship carries supplies, fuel, spare parts, and has a complete forge and workshop, where repairs to machinery can be made. This mother ship was an old monitor before it was assigned to its present duty. It carries two 22-in. guns but is not suited for regular ocean duty as it lies too low in the water.

## ONE OF THE GREYHOUNDS OF THE SEA



Soon after the self-propelling torpedo was invented, many torpedo boats were built, but soon larger boats, called torpedo boat destroyers, took their places. This is one of many United States destroyers. It has a speed of nearly thirty knots, and carries four torpedo tubes and four 4-inch guns. Such boats are dreaded by enemy submarines, because of their speed and the accuracy of the fire of their guns.

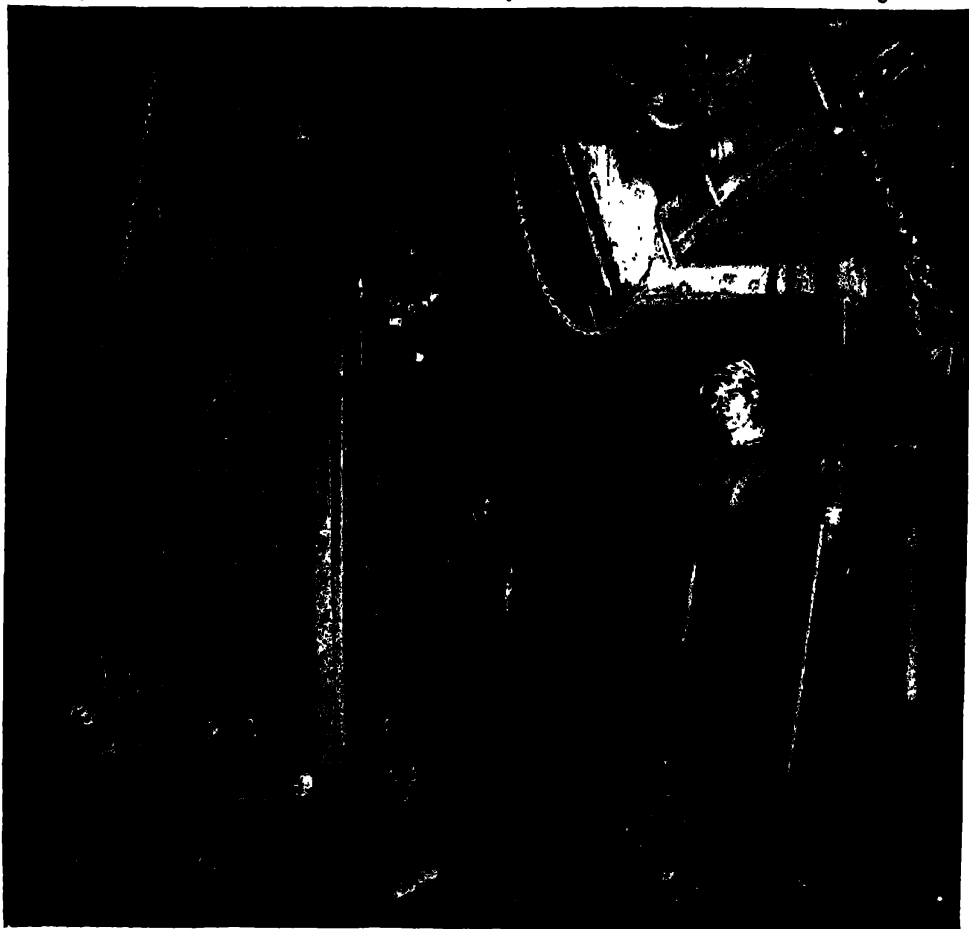


Here we see sailors working on a torpedo, which is fired from the torpedo tube to the right. The explosive is in the nose of the torpedo, which we cannot see. The body of the torpedo contains the chamber for compressed air and the machinery which moves the propeller and guides it. The torpedo is shot over the side of the ship by compressed air, and then moves by its own power.

## THE LIVING HEART OF A GREAT SHIP

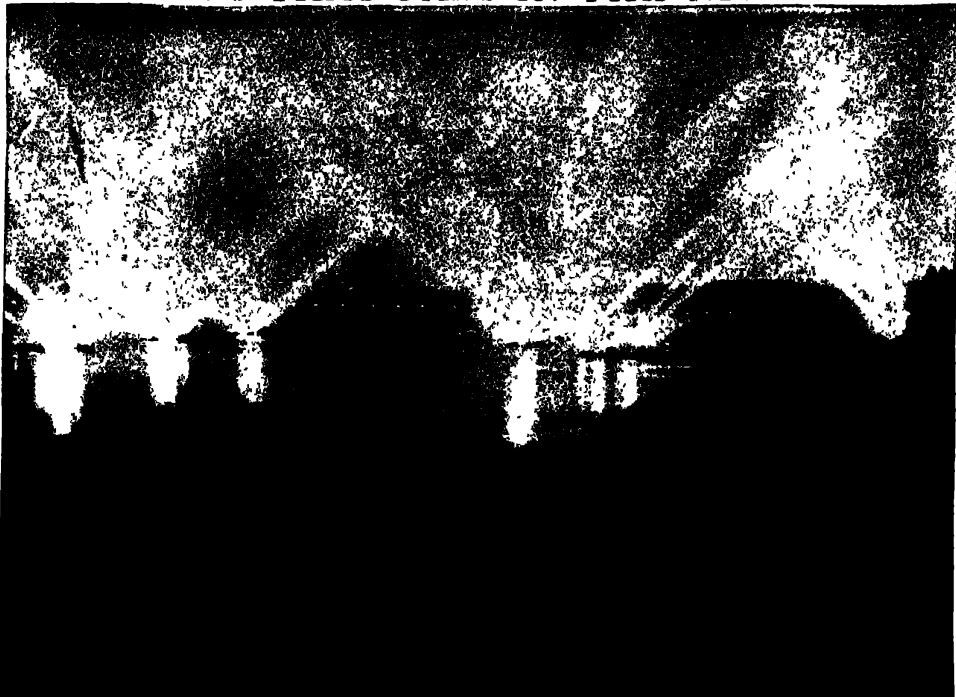


The great throbbing engines are the heart of a battleship. They give life to the floating giant and send it through the waves at the rate of more than twenty miles an hour. Here we see the engine-room.



The engines of the latest battleships do the work of over 30,000 horses, and when they are moving the furnaces must be fed. This is the stoke-hole of a battleship, where the coal is shoveled into the furnaces.

## SHIPS THAT PASS IN THE NIGHT



The battleship must not only be watchful by day, it must be effective at night; in order to keep keen look-out for enemies, it is fitted with wonderful searchlights that can be flashed in all directions. These lights are of many thousand candle-power and reveal quite distinctly places and objects miles distant.



Magnificent and imposing as is a battleship by day, when its steel walls and powerful armament are plainly seen, it is, perhaps, even more impressive by night, when its massive outlines and sombre figure, only dimly to be perceived, are dark and ominous. Themselves almost invisible they can at any moment throw a powerful light upon their foes. The possibilities of these great fighting vessels are appalling.

## BIG AND LITTLE GUNS ON A BATTLESHIP



While the chief power of a battleship is its heavy guns, they carry lighter guns, and the smaller ships, of course, cannot carry the heavy guns. Here we see the guns of small calibre being fired from a small ship. The sailor with the telephone at his ears is aiming the gun according to directions received from an officer above. One shell is in the gun and you see that two sailors each have another ready.



So far no United States ship has carried larger guns than fourteen-inch. They are arranged three in a turret, which can be turned. Here you see six of the twelve heavy guns on the Pennsylvania. They throw shells weighing 1,400 pounds. Five hundred and fifty pounds of powder is required to send out these missiles. Some countries have ships with eight fifteen-inch guns, and the United States is experimenting.

## DAILY ROUTINE ON A GREAT BATTLESHIP



Sailors do not often come very close to the enemy, for most naval battles are fought at a distance of several miles. However, it may be necessary to land a party sometimes for various reasons. The sailors therefore are drilled in the manual of arms, exactly as soldiers. Here we see a part of the crew of a great battleship being drilled on the deck, by the officer in the background. Some of the sailors are curious.



Everything about a battleship must be kept scrupulously clean since so many men must live in a small space. Even the decks are washed and scrubbed every day until they shine. Here we see the sailors whose turn it is to do this work, making the deck so clean that one could eat from it. The effect of the light and the wet deck makes a very attractive picture, which the sailors probably do not notice as they work.



done. One or more of these will go with every fleet.

Now who are the people on the battleship? Let us first take the officers. In our story of Annapolis we told you that the young graduate was appointed an ensign. This corresponds to the second lieutenant in the army. Next in rank is junior lieutenant, equal to first lieutenant in the army, while lieutenant corresponds to captain. Next comes lieutenant-commander, corresponding to major, and commander, corresponding to lieutenant-colonel in the army. The captain in the navy is equivalent to the colonel in the army.

are the clerks. Hospital attendants, druggists, cooks, bakers, etc., are also needed.

When a young man enlists he is usually sent to a training station for a few weeks or months. Here he learns the drill, the great lessons of obedience, neatness and promptness, and begins to learn his duties. Many things on a ship are not done the same way as on land. The sailors sleep in hammocks, which are rolled up out of the way in daytime. The tables from which they eat, are often swung up to the ceiling to get them out of the way when not in use. Every inch of space is precious, and the same room must be used for several



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The food served on the ships is always good, but on holidays and special occasions extra attention is given to the bill of fare. Young men almost always improve in health while in the navy. Here you see the cooks preparing for Thanksgiving. A great quantity of everything is required to feed several hundred hungry men

Above the captain the ranks are rear-admiral, vice-admiral, admiral, and admiral of the navy. There are many petty officers and warrant officers, which correspond in a general way with sergeants and corporals in the army, though their positions are more important in some ways and they get more pay.

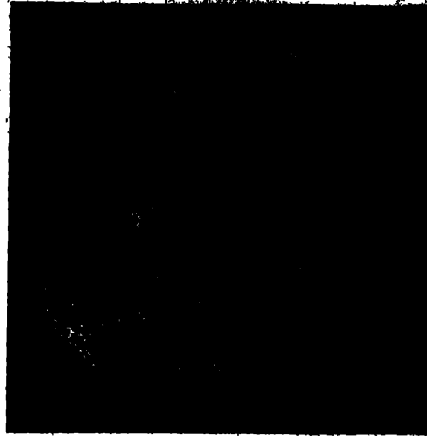
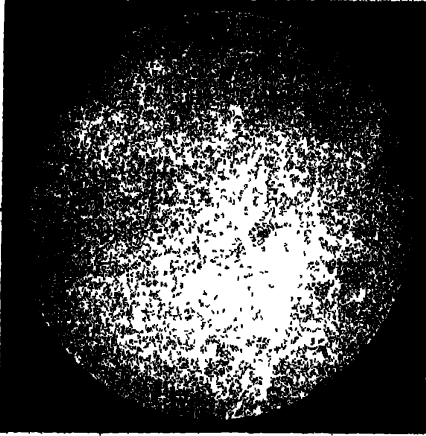
A sailor enlisting in the navy for the first time must be between seventeen and thirty years of age, and must be able to read and write English. He may enlist as a seaman, or for work at the particular trade he knows. A battleship is a great mass of complicated machinery, and blacksmiths, carpenters, machinists, shipwrights, steamfitters, plumbers, electricians, and the like are needed. Yeomen

things. Each sailor has a box with a lock in which he may keep any small thing he prizes. His clothes are kept in a strong bag and every article must be folded and rolled in a particular way. An officer frequently inspects the bags, and the young recruit soon learns to be orderly.

Enlistment in the navy gives many young men a better education than they would get outside. Classes are held on shipboard in time of peace, and besides a young man may learn a trade which will enable him to make a good living when his term of enlistment has expired. In addition he sees the world, gets good food and clothing, and learns habits which will be of use to him in after life.

THE NEXT STORY OF FAMILIAR THINGS IS ON PAGE 6259.

## The Book of WONDER



When we say that we can see a man in the moon we mean that the shadows seen in the left picture look like the eyes, nose, and mouth of a man; but in the right picture, which shows the moon as seen through a telescope, our artist shows us how we may get a very much clearer image of a man in the moon by merely emphasising a few of the lines that are really in existence.

## WHO IS THE MAN IN THE MOON?

FANCYING that we see faces or figures in the moon is rather like playing the game of pictures in the fire. At times we can certainly imagine that we see a great face in the moon, though we change as we grow older, and the writer of these words, who used to see the face very clearly when he was a child, has not seen it for many years—probably because he is looking for something else.

At any rate, there is no doubt that there are markings on the moon, and that in proportion to the moon's size they are very large, and many of them very high. We can prove that they are so by measuring the length of the shadows which they throw upon the moon's surface when the sun's light catches them sideways. These markings are partly what we must call mountains; they are partly, perhaps, in the nature of creeks, or clefts, and the most remarkable and beautiful of them look like craters of huge volcanoes. These are very large and have very high sides, as we can see when the sun shines sideways upon any of them. It is these

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craters, above all, that help us to see the man in the moon, or the little old woman gathering sticks, or whatever else people have thought they could see there.

There remains, however, a deeply interesting question which astronomers are now studying keenly. Are these craters really craters, and was the moon's surface really once covered with gigantic volcanoes? Some argue that things are indeed what they seem on the surface of the moon, and that the volcanoes were very large because the moon is so small. That sounds curious, but the explanation is that the moon, being small, would cool very quickly, and if it cooled very quickly and shrank very quickly its volcanoes would all be on a large scale.

But other astronomers are beginning to say that perhaps these markings never were volcanoes at all. They argue that the moon has no atmosphere to act like a great protective blanket or like the armor-plate of a ship, as our atmosphere does, and that the effect of meteorites, or shooting stars, falling upon the moon

would therefore be very serious. They argue that, at a certain stage in the moon's history, when its surface was much softer than it is now, pieces of rock, or whatever we like to call them, flying about in space and striking the moon at a tremendous rate might produce those effects which we now imagine to be craters. If this is true, the "marks" are not really craters at all, but are mighty scars, or holes, punched in the moon.

### HOW DOES A GYROSCOPE WORK?

A gyroscope is very like a top. Indeed, it is only a very heavy and carefully-made top. It usually takes the form of a wheel with a heavy metal rim, and this is held or enclosed in such a way that if it is set spinning it can do so freely. Of course, any spinning thing tends to slow down, owing to the resistance of the air, and the friction where it is supported—unless, like the earth, it does not spin on anything. So by various means a gyroscope may be made to go on spinning, and then we can observe its behavior in all sorts of conditions.

It has been learned by men of science that mere motion will give resistance and force and all the properties of hardness and rigidity to things which had not these properties before. This is true of the gyroscope. Its spinning motion gives it the power to resist very firmly anything that tends to alter the direction of its spin. The heavier the gyroscope, the greater will be the amount of motion in it when it spins, and the greater its resistance to any force that tries to alter the direction of its motion.

Therefore, a railway car may run safely on a single rail without tilting over, simply because it carries a spinning gyroscope, spinning so fast and made so heavy that its tendency not to be disturbed or tilted will prevent the car from tilting.

### WHY ARE CHILDREN FOND OF DOLLS?

Some people have said that children are not fond of dolls because they are dolls, but because they are possessions. These people declare that the secret is found in the liking which children have to possess things, just as grown-up people have the same liking, and that children will become quite as fond of anything else that is theirs as they will of a doll.

But those who really know anything of children know a great deal better than this. They know that, as a rule, a child, at any rate during several years of its life, is far fonder of a doll than of anything else, and that the child is more pleased with the chance to nurse a real baby. So the truth is that the love of dolls is really the mother-instinct and the father-instinct showing themselves already, even in little girls and boys.

Often little boys are told that they should not play with dolls, but with soldiers. One little boy, who had not been taught such nonsense, had his doll out with him in the street, and some big boys cried out and jeered at him. But the little fellow had a good reply. He turned round and said, "None of you will ever be a good father."

### WHY DOES A HEN CACKLE AFTER LAYING AN EGG?

Of course this is not an easy question to answer, for we cannot ask a hen why she cackles, and indeed, if she could speak, she could not give a reason; for this act, like many of our own, is not a reasonable one, but simply a consequence of the way in which a hen is made. It is what is called an instinctive action. Yet we can understand it because we can compare it with actions of other creatures about which there is no doubt.

The doing of anything which we were meant to do gives us pleasure. The bodies of living things are constructed in this way, as we might well expect. Now, pleasant feeling in ourselves and in other creatures often excites the body to some kind of activity, as when we say that a person sings for joy. When we feel very pleased with ourselves we want to sing, or whistle, or dance, or do some such thing. It is a question of what is called the expression of the emotions. A dog has the advantage of us in one respect, because it has a tail, and when a dog is pleased, it not only gives a special bark, which is its way of singing for joy, but it also expresses its emotion by wagging its tail. On the other hand, an angry lion will sway its tail from side to side, and express its anger in that way.

So when the hen cackles after laying an egg, it is simply her way of singing for joy. Her body and her feelings have

the satisfaction of having done something which her body is meant to do. It is probable that the actual laying of the egg causes discomfort, and there is a corresponding feeling of ease and satisfaction when the task is done.

#### WHAT ARE "BLIND-ALLEY" OCCUPATIONS?

A blind alley is a road along which one can go for a certain distance, and then no farther. We have to go back and make a fresh start, and we have lost all our time. And so we now give the name of "blind-alley" occupations—a name which every boy should know—to those which seem to offer a road to somewhere, but lead a boy nowhere, waste years which he can never regain, and perhaps even destroy his power to learn something better afterwards.

All who have studied the subject know how important this question is, and boys and girls should all be warned in time of the consequences of going into a "blind-alley" occupation. A boy leaves school at fourteen or sixteen, and can at once get employment which brings in a few dollars a week, but which teaches him nothing. For instance, this may be the case with telegraph boys, as we all may see. After a few years, when the boy is beginning to become a man, and to expect a man's wages, he is, instead, turned off to make room for a younger boy. Since his "blind-alley" occupation has taught him nothing, and has only given him time to forget what he learned at school, he has to seek unskilled and poorly-paid labor, and often can get no work at all. Many scores of thousands of boys and girls in our country are now in these "blind-alley" occupations, and the time has come when we must put an end to a process which causes so much harm. It injures the boys and girls themselves, and it afterwards only too often makes them a burden upon the nation, instead of part of its real wealth.

#### WHY CAN'T LIGHT TURN A CORNER?

There are several ways in which light can be made to turn a corner, but it is true, and it is one of the most important facts about light, that it naturally travels in straight lines. This does not mean that the light from a lamp travels only in one direction. It travels equally in straight lines in all directions, and since it is a property of light to travel

in straight lines, of course it cannot turn a corner by itself.

But fortunately there are many ways in which light can be made to turn a corner, for there are many ways in which rays of light can be bent or turned. By means of a mirror, or any surface which reflects light at all, light can be made to turn a corner, or any number of corners, so long as at each there is placed a reflecting surface. In just the same way, of course, a ball can be made to turn a corner.

Light can also be readily made to turn a corner by what is called refraction. This is the name given to the bending of a ray which in passing from one thing to another, as from air to water, or air to glass, becomes, as it were, cracked.

#### WHAT IS A CYNIC?

The word cynic is simply the Greek for *dog-like*, and means a person who has rather a snarling and dog-like kind of temper; at least, that is supposed to be the origin of the name. The great argument of the cynics in ancient Greece was that men must give up luxury and beauty, and even cleanliness, and any kind of decent human comfort. As we can imagine, they were not pleasant people, though it cannot be denied that they showed much courage and suffered much discomfort. One of the most famous of the cynics, pretending to be very humble, used to show himself in a cloak full of holes—a perfect instance of what has been called "the pride that apes humility." This particular cynic lived in the time of Socrates, who said to him, "I see your vanity peeping through the holes in your cloak."

#### WHICH IS THE BIRD WITH THE LONGEST TAIL?

We all know that the peacock's tail, which is so beautiful when opened out, is very long when it is closed up; but there are some birds in Japan that have tails as much as twelve feet long, and when they walk about in the open air special train-bearers support their tails, so that the feathers may not be dragged through the dust and dirt. These birds are a variety of the barn-door fowl. In the same way pouters and fantail pigeons have been developed in Europe from the common pigeon. The long-tailed cocks are reared at Shinowara, a village in the island of Shikoku. That they

may not damage their tails they are kept in high, narrow cages, lighted at the top.

The bird naturally remains on the perch at the top, its tail hanging gracefully down. It is seldom allowed outside its cage, and then it walks in the open air for about half an hour, followed by its tail-bearer. Occasionally it is washed in warm water, and allowed to dry its feathers in the sun.

For traveling, special long, narrow boxes are used, and the feathers are bent as little as possible. The root of the tail in these birds is much stronger than it is in an ordinary cock. Even the feathers on either side of the body grow to an enormous length, and hang down with the tail feathers to a depth of three or four feet, so that the tail has the appearance of being not only very long but also very bushy.

#### WHY DOES A LEVER MAKE A WEAK MAN STRONG?

In the case of all levers and pulleys the principle is the same. No form of lever or pulley makes power out of nothing. The secret lies somewhere in the special way in which the power is applied to the weight which it has to move.

If we think of a simple case of a man using a long iron rod to dislodge a piece of rock, by pressing the rod, near its lower end, against something firm, we shall see that the two ends of the lever—that is, the rod—move through very unequal distances in the same time. We can see this for ourselves by holding a pencil across the edge of anything, with nearly all the pencil on one side. Then, if we tilt it up and down, one end moves through a very much smaller distance than the other in the same time. The more unequal the two arms of the

pencil, the greater is the difference between the distance moved by the two ends of the pencil.

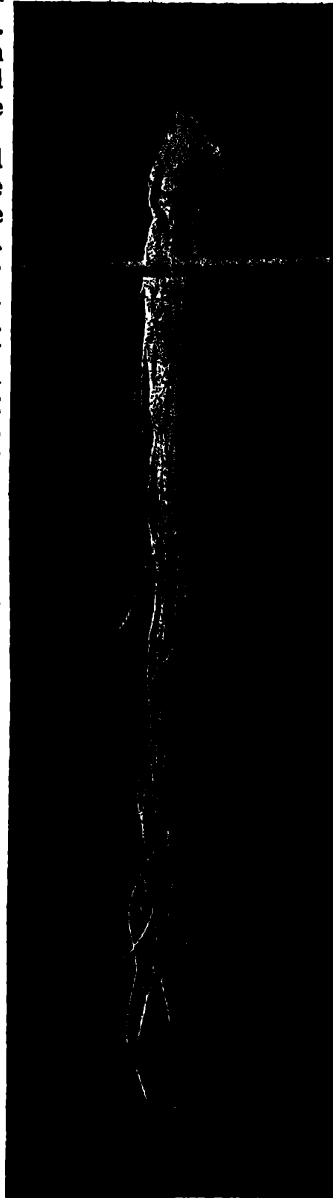
That is what happens when a man is levering up a stone. He has not strength enough to move the lower end of the lever by pressing there, but he can get the necessary movement there by spending his power over a greater distance at the top end of the lever. Less power is required there, but it is required to act through a greater distance. So the work is done, and the law that power cannot come from nowhere holds good in this case as it does in all others, no matter if it does seem otherwise.

#### WHERE WERE THE FIRST LIGHT-HOUSES BUILT?

It is difficult to think of a time so far back that there were no lighthouses to guide the sailor on the pathless sea and protect him from dangerous reefs, shoals and cruel rocks. No doubt the very first lighthouse was the light set in the window by the fisherman's wife to bring his boat safely home. And today, we have lighthouses whose flashing or revolving lights can be seen for many miles at sea and which protect the dangerous coasts all over the world.

It is said that the first lighthouses were built in that oldest of countries, Lower Egypt, but it is so long ago that no one knows just when. These early timers were very crude. The fuel was placed in a large pot and hung from the end of a pole which projected from the tower

like the flagpole from a window. The first regular lighthouse built to guide sailors was stationed on a cape of Asia Minor, in the Troad, and a Greek poet 660 years before Christ mentioned it, so we see that this poet gave us something



A Bird's Tail 12 Feet Long.

more valuable than his poetry, which no one ever reads.

### WHY IS A LIGHTHOUSE CALLED A PHAROS?

One of the most famous lights of history is the Pharos of Alexandria. It was built of white marble and stood on the island of Pharos at the entrance of the great harbor. From its summit, 400 cubits above the sea, an immense beacon fire of wood could be seen for thirty miles. It was completed 280 years before Christ, in the reign of Ptolemy Philadelphus, and was one of the Seven Wonders of the World. It took its name from the island on which it stood, and after that date Roman lighthouses were spoken of by this name, "pharos." This beautiful structure, 100 feet on a side built in terraces, lasted for 1,600 years, until destroyed by an earthquake. The lighthouses at the English port of Dover, and the French port of Cologne, were built by the Romans and were supposed to be the first lighthouses ever built in Western Europe. The Colossus of Rhodes, another one of the Seven Wonders of the World, may also have been a lighthouse.

The earliest lighthouse which was built on a rock in the ocean, swept by waves, and which is still standing, was built at the mouth of the Gironde River in France. The Cardouan Light was begun in 1584 and finished in 1610, but earlier towers are said to have been built upon this very rock by Louis le Debonnaire about 805, and later by Edward, the Black Prince. The light which shone from this tower was at first made by the burning of an oak log, and later by a coal fire, which was lighted in an open basket or grate, called a "chauffer."

To-day "the light that shines over the sea" is of many kinds. It is made by electricity, by a kind of gas called acetylene gas, and by oil gas, which is largely used in the United States and England. Oil for this purpose is brought to the lighthouse in large iron tanks and stored in a room near the entrance, and from there it is pumped up into the lantern. By means of lenses, prisms and reflectors, the rays which would naturally turn upward or downward are thrown out in a horizontal line. The electric light of Heligoland, an important island in the North Sea, is equal to the enormous number of forty-three million candles, and the Highland Light at Navesink has sixty

million candle power, and flashes its light a distance of twenty-eight miles over the water.

### WHICH IS THE OLDEST LIGHTHOUSE IN THE UNITED STATES?

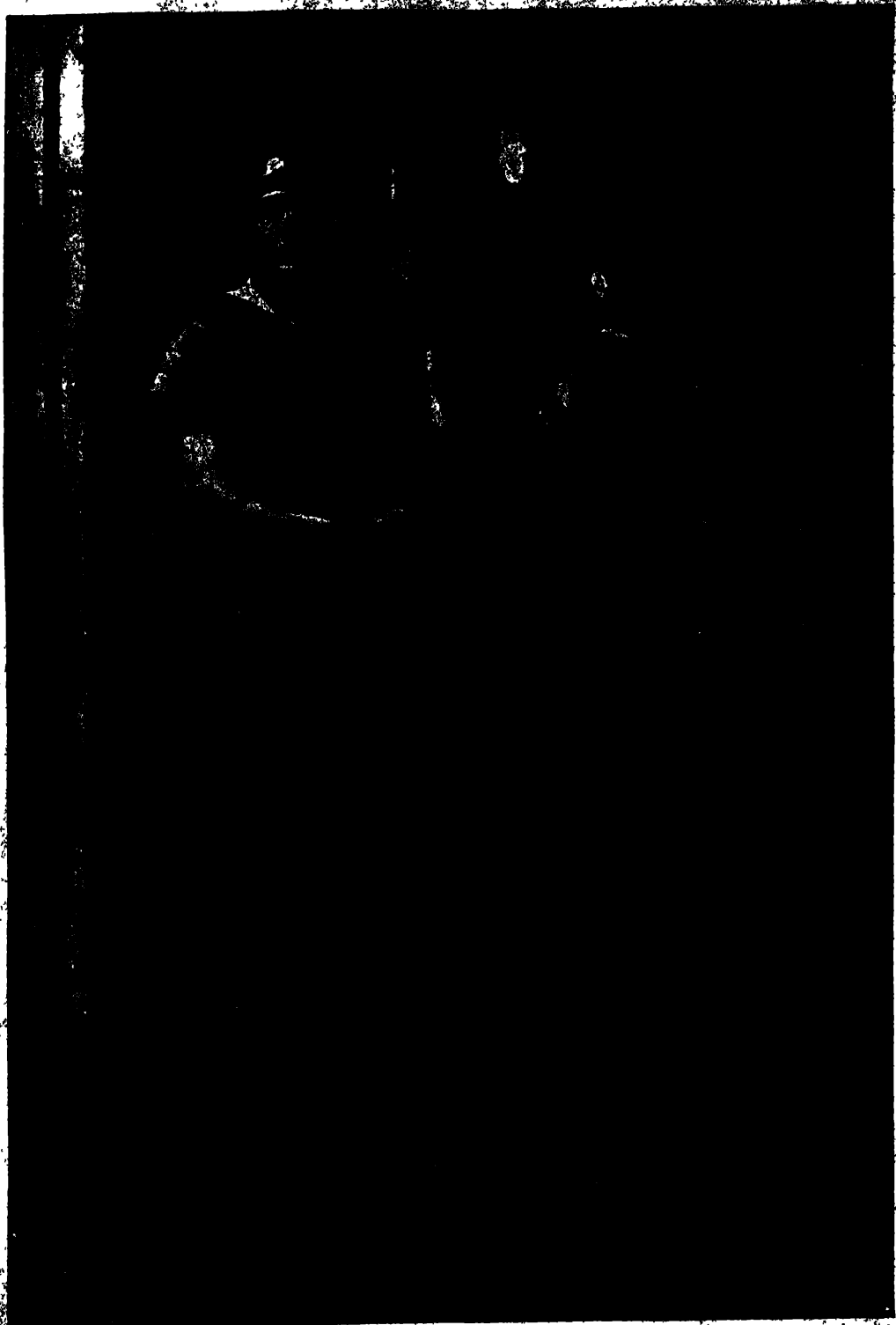
The oldest lighthouse in this country is the Boston Light, which has been shining from Little Brewster Island ever since the year 1716. Some one may ask whether it is the very same lighthouse which was built then, but a little thought will answer that question, for we know what power there is in the winds and waves beating constantly against the rocks to wear them away, and a lighthouse would be far more easily destroyed than solid rock. The lighthouse which stands on the island to-day was built in 1819. During the Revolution it was destroyed and rebuilt no less than three times.

### WHY ARE LIGHTSHIPS USED INSTEAD OF LIGHTHOUSES?

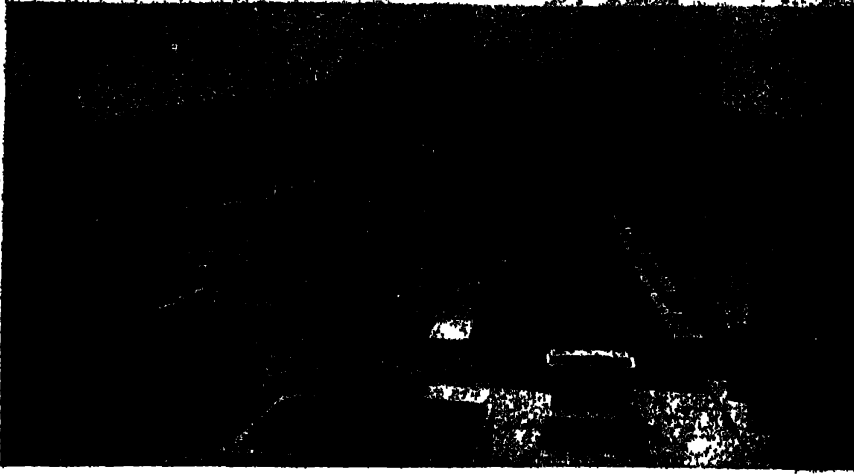
The most famous lighthouses in the world are built miles out at sea and the task of building such a tower in these dangerous places is one to awe the stoutest heart and tax the utmost skill. And there are many places where no lighthouse can be built on account of the terrific force of the wind and the waves and the strength of the currents. These reefs or treacherous shoals or sunken rocks are protected by lightships. One of the best known in this country is the Ambrose Channel Light, off Sandy Hook. The lightship off Cape Hatteras guards the dangerous Diamond Shoal. There is another at the Nantucket Shoal, and many more all along the New England coast. All these ships are equipped with wireless telegraphs, which is a safeguard to the ships.

There are lonely spots where no man could live without the danger of losing his mind, and here lights are stationed, called "unattended lights," because they are worked by wonderful clockwork devices, and no one goes near them for periods varying from three months to a year. The light burns all the time or is lighted at regular hours by mechanism, or, more wonderful still, by a Swedish invention which makes use of the sun. As the sun rises and sets, its increasing or decreasing light works a valve which controls the flow of the gas so that the light begins to shine after sunset and goes out after sunrise.

## THE FAITHFUL SENTINEL OF POMPEII



When the city of Pompeii was overwhelmed by burning ashes and destroyed, a brave soldier stood at his post to the last, watching death come towards him. When, 1,700 years after, the diggers found the ruins of the city buried in the earth, they found the soldier's body lying where he had kept watch. Sir Edward Poynter has painted this picture of the sentinel who was "Faithful unto Death," and it hangs in the Liverpool Art Gallery.

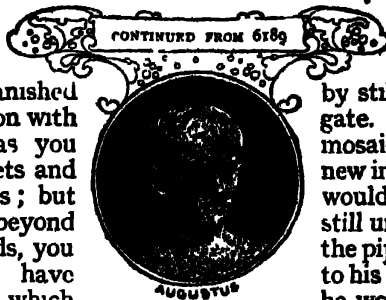


## WHAT I SAW AT POMPEII

NOTHING will live longer in the mind of a visitor than this city of a vanished life, a sight to look upon with doubting eyes even as you walk through its streets and sit down in its houses; but something almost beyond belief, when, afterwards, you fill in all that you have seen of this city which passed out of the world in a night.

There are mightier ruins in the world than Pompeii, things bigger to look at, things bigger in history, things that stir the mind more in themselves; but nowhere is there so great an area of ruin so well restored to its former appearance as this.

Here is a city nearly two miles round, with streets of houses, with market-places and shops, with gardens and squares and monuments; all so well preserved that if the tenant of one of these houses were to come back to life, and were set down at one of the three gates of Pompeii, he would walk along the old pavement he helped to wear down over 1800 years ago, and would walk to his house quite



naturally, and perhaps recognize his old home, in some cases, by still fresh paintings at the gate. He would find the mosaic floor still almost as new in many of his rooms; he would find beautiful statues still unbroken; he would find the pipes which brought water to his bath still in their place; he would find the bath still

capable of holding water; and he would find things at home in such a condition that no power would make him believe that his home had been buried in the earth over 1,700 years. It is difficult to think of anything so hard to believe as Pompeii. Every little detail has been preserved. Here, in a kitchen, is a pan on the fire, resting on the ashes which were boiling water more than fourteen hundred years before the discovery of America.

It is this which makes Pompeii almost too true to be true—the preservation, through all that dread catastrophe, through all these nineteen centuries, of *the very life of the moment when Pompeii heard its doom.*

The architecture of this vast ruin is



wonderful. The freshness of some of the color is as if it were done yesterday. The sense of luxury is everywhere, and there is even a sort of atmosphere that comes up from the long ago. But the miles of ruin, the well-planned houses fit for kings, the famous frescoes and mosaics, which are in some cases our only picture-record of historical events, are, with all their value and their tremendous interest, not the most impressive fact of Pompeii. Pompeii is unmatched as something preserved through nearly twenty centuries, preserved in big and in little so that identity is easy; but Pompeii is unique in the world because it has stamped for ever upon the earth itself the life of a single moment in the dim mists of Time. Remember, a moment; not a period, not a day, not even an hour—but a *moment*, for one may see the pan boiling on the fire, the loaf of bread half eaten, the meat being cooked for dinner, the wine still in the bottle, the ink still in the pot, the key still in the door.

You may visit the cellar where sixteen people hid themselves when the calamity came, where the master of the house was found with the key in his hand, a slave close behind him with money and valuables. Outside is the courtyard from which they must have fled.

You may even see the pain on a man's face as he died on that terrible day. There were no cameras to take photographs then, but Nature can do without cameras.

In the ashes where they lay, the features of these poor people were pictured as in a photograph; the ashes hardened so that the likeness was preserved through all the centuries; and when these bodies were discovered there came to Signor Fiorelli a wonderful

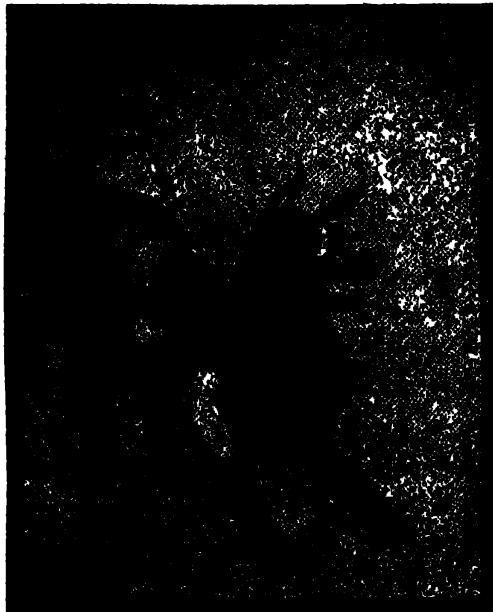
idea. Removing the bones carefully, he filled the space with plaster, making a perfect image of the figure which had lain there, hidden from sight for more than a thousand years. And here to-day lies the image of a man who died in that terrible ruin, his face wrought with the very pain of death. Not all the destructiveness of Vesuvius, not all the weight of the earth for nineteen hundred years, has changed a muscle of this dead man's face, and his image lies here to-day that all the world may see something of that awful moment when a great city vanished from the earth. Near by him lies the image of a dog.

And here, near the homes in which they lived, lie images of other men and women—men and women no longer now, but only forms, statues that Michael Angelo or even a greater than he never could have rivaled.

It is almost tame, after this, to think of all the wonderful things the guide would show you if you allowed a guide to hide the interest of Pompeii from you, as guides do; but there are three wonders of Pompeii.

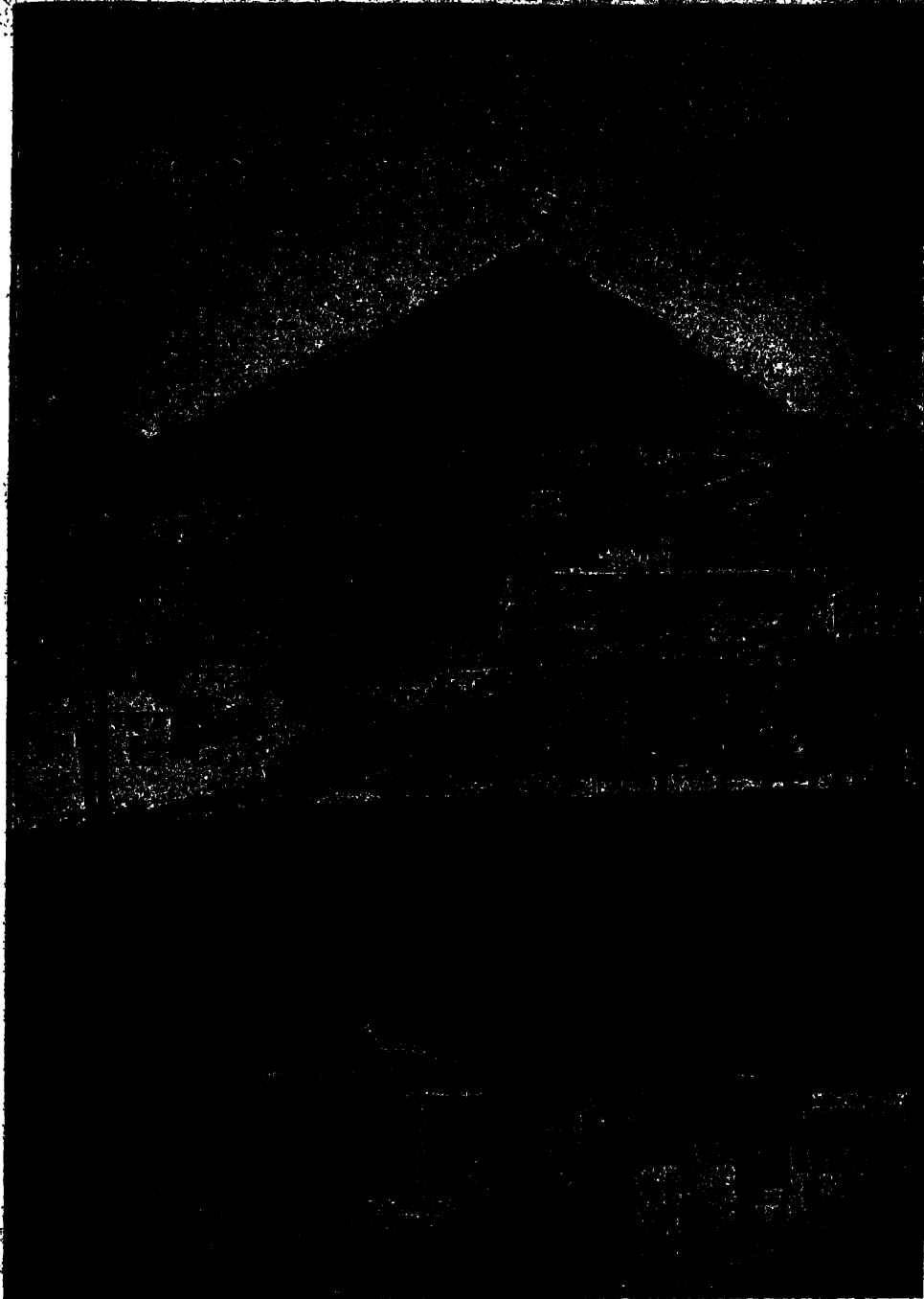
There is the wonder that it should ever have been built, so rich in art, so poor in vision; there is the wonder that so much of it has been preserved from so tremendous a destruction; and there is the wonder that it should have been lost hundreds of years and found again.

It must have been an interesting city in ancient times, and there is no wonder that Rome flocked here to live its lighter life, that an emperor and statesmen and poets and nobles had houses here. And what houses they were, occupying a whole street sometimes, lavish in paintings and marbles. It is odd to stand at the gate of one of these houses and look at the mosaic in the floor, a picture of a dog, with the old *Cave Canem*, "Beware



A mosaic in the floor of a doorway in Pompeii, with the words *Cave Canem*, "Beware of the dog"

## HOW A CITY WAS SEALED UP BY A STORM



### THE BEAUTIFUL CITY OF POMPEII, AS IT LAY HIDDEN FOR NEARLY 2,000 YEARS

No more terrible fate ever happened to a city full of life and gaiety than that which befell Pompeii, with its splendid buildings—temples, palaces, baths, and theatres—in which were stored many treasures of art. On the morning of August 23, in the year 79 A.D., it must have been a brilliant sight to see. But within a few days Pompeii and the neighboring city of Herculaneum, lay buried, to be remembered only in name for the next seventeen hundred years. Mount Vesuvius, which had been sleeping for centuries, woke up suddenly in the year 63, and caused an earthquake that destroyed a great part of Pompeii. The people rebuilt the city, and had almost finished it when a still more terrible calamity overtook them. The mountain poured forth a storm of burning ashes, which fell upon the city and buried it completely. Then heavier cinders poured forth from the mountain and sealed it up, as shown in this picture.

## POMPEII COMES OUT OF THE EARTH AGAIN

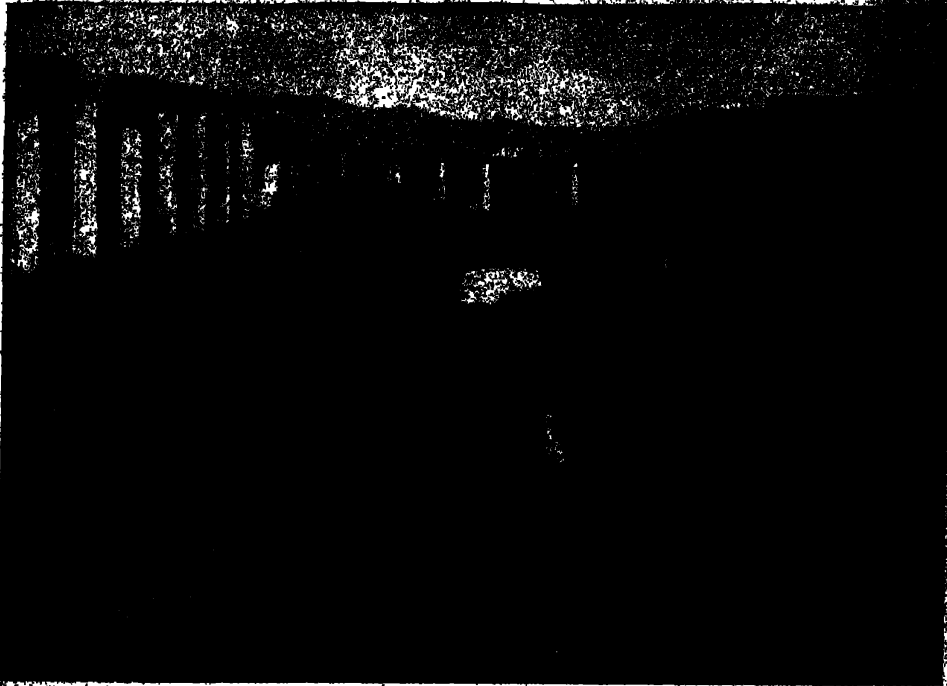


Pompeii, buried for more than seventeen hundred years, has in the past century been brought to light, and here we see it as it is to-day. Here are streets and pavements, houses and shops, theatres and temples, law-courts and market-places, in which we can walk about as the old Romans did.



This shows one of the main streets of Pompeii, which has been completely unearthed. The curbstones and stepping-stones, paths and roadway, are exactly as in the days of the Emperor Titus. Nearly all that we know of Roman life and manners has been revealed by the discoveries at Pompeii.

## BEAUTIFUL COLUMNS COME TO LIGHT



This is the Basilica at Pompeii. The word basilica comes to the Romans from the Greek and means either a court of law or a sort of merchants' exchange. In form it was a long rectangular hall supported by great columns. Later both the word and the kind of building were borrowed for churches.



The view of the ruins of Pompeii given on the preceding page was taken from above, and does not show the open spaces shown in this, which is even more interesting, if there can be said to be degrees of interest in this marvelous city. Notice how clearly the beautiful fluted columns stand out. Soon after the destruction of the city, the ruins were reached by tunneling down through the lava, and many valuable objects were removed. Then the people went away, and the ruins were forgotten. Photographs from Brown Bros.

of the dog," under it; and it is wonderful to stand in the garden of another house, with flowers growing now where they grew then, with lovely little statues still unbroken where they were first set up, with the gateway still fresh with paintings, with color everywhere, and with people moving to and fro, and to imagine to yourself that the lord of the house is giving a party and you are among the guests. No great imagination is called for at Pompeii, for if imagination did not people these houses and these streets the very stones themselves would cry out. One thing you

corner of Pompeii was left unadorned: it is astonishing to see the splendid friezes in the arcades, where things were bought and sold: even the butcher and the fishmonger, with their benches next to an emperor's temple, carried on their unlovely work in an artistic environment. It is not easy to understand how rich this place must have been until you have seen the museum, because it has been the habit in the past to carry off the art treasures of Pompeii to Naples. The city itself is to-day without roofs, like a city after a great fire has done half its work, with beautiful



A PAN STILL ON A FIRE IN A KITCHEN IN POMPEII, AFTER BEING BURIED 1800 YEARS

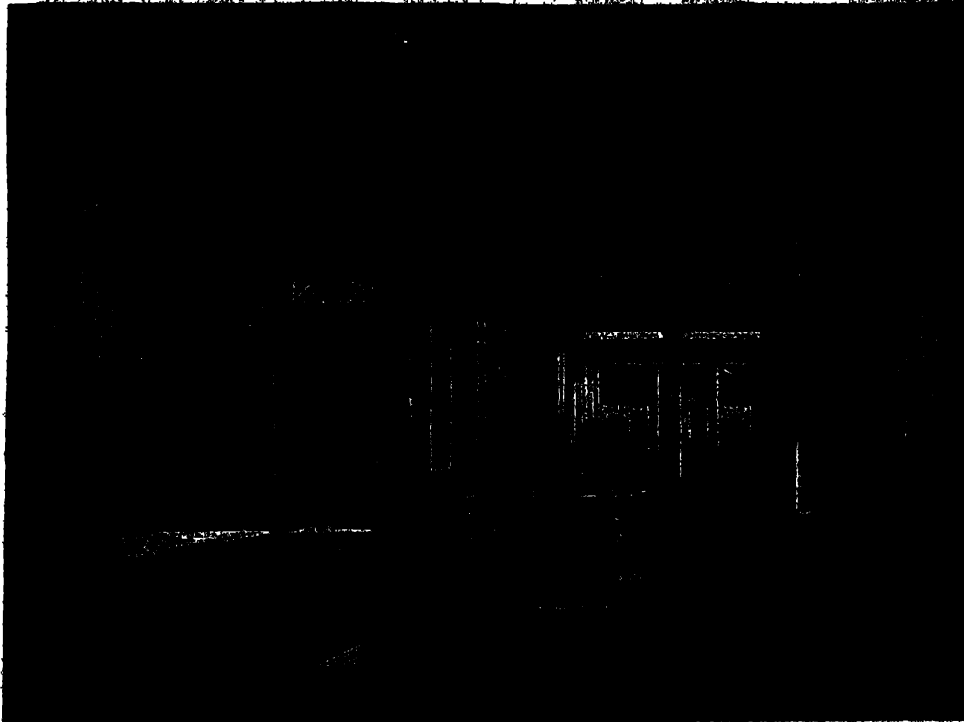
must do, however, before you go to walk about these streets of destruction: you must go upstairs and downstairs in the museum in Naples, where what is left of all that was beautiful and all that was useful in Pompeii is gathered together. Here is a collection that must stir the dullest mind that ever wandered mechanically about a great museum. Here are the marbles—frescoes, statues, columns, tombs—that made Pompeii a beautiful place to walk about in.

Hundreds of pieces crowd the ground floor of this museum, most of them in marble or in bronze, and most of them from the villas and temples and streets and spaces of this stricken city. No

things left only inside houses and courtyards.

For, of course, the treasures of Pompeii can never be brought together again. How much of this artistic wealth must have been destroyed in that year 79! How much was carried off by the inhabitants, who tunneled underneath the lava ashes to find their treasures. How much lies still buried in the earth, waiting for the spade to bring it into the light of day! Only half, perhaps, of this field of ruin has been recovered since the work of excavation began in the eighteenth century. Men are still at work digging up houses and gardens and marbles, and nobody knows whether there may be a new piece of

## A HOUSE IN POMPEII—AS IT WAS AND AS IT IS



The wealthy noblemen of Rome had beautiful palaces at Pompeii, to which they went in the hot summer months, just as people go to their country houses nowadays for a vacation. Here is the atrium, or drawing-room, of a fine house in Pompeii. The house belonged to a man named Cornelius Rufus.



Here we see the same room as it appears to-day. In the middle is a marble water-basin, set into the floor and surrounded by mosaics, and on the margin are the supports of a rich marble table. Rooms opened out all round, and in the distance can be seen the remains of the peristyle—an open court.

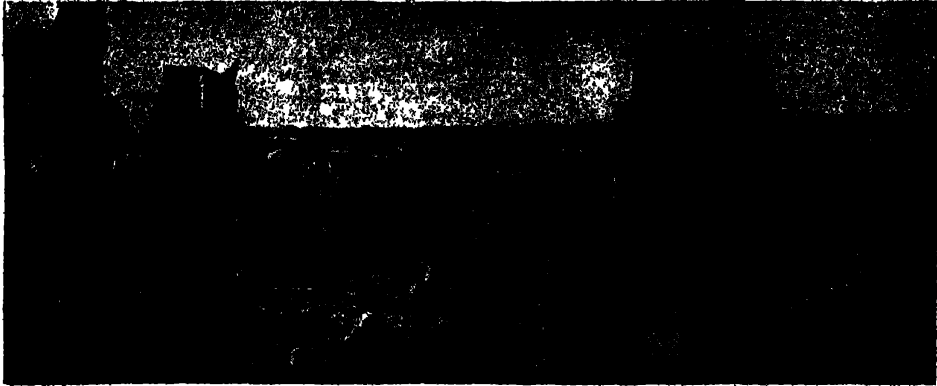
sculpture, or some beautiful fragment of mosaic.

For hundreds of years this great treasure-house was unknown to the world, for the ancients left it covered up when they had taken from the ruins all that they thought it contained, or all that they thought worth digging for. But Vesuvius spat out dust enough to bury Pompeii nearly twenty feet deep, and so it happened that the ancients robbed the surface only, leaving the depths to be trampled down or built over or neglected throughout the Middle Ages. Then a farmer would dig up a piece of marble, and perhaps it would be a man's hand. A peasant found a piece of cloth as he dug his garden one day, and used it to clean out his oven. It did not soil, it did not burn—because it was a piece of asbestos cloth in which

brought out to the light of day to show us the life of these people of long ago.

Here are the things with which they beautified their homes—little pictures for the mantelpiece, hundreds of pictures from their walls, lovely vases of every kind. Here are locks and keys, and every sort of thing still used in a kitchen; pots and pans, and salt cellars, and scales, and bottles, and knives; things for boiling twenty eggs at once; little stoves; actual beds that people slept on, chairs they sat in; stocks they put their prisoners in, in which four skeletons were found; safes for their valuables; pens they wrote with; ink still in the bottle, though now dried up; and even doctor's instruments made of bronze.

In one room are the cakes that were on the table when the calamity came, a loaf half cut, meat in a saucepan



A PAVEMENT LAID ON A STREET IN POMPEII OVER 1800 YEARS AGO

some ancient Roman had wrapped the ashes of a dead friend!

Coming to Pompeii by train, the traveler sees green orchards with stone columns rising among the trees, filling the mind with wonder as to what lies beneath. We come, too, upon whole fields black with lava, which remind us that even while men dug up one civilization Vesuvius covered up another.

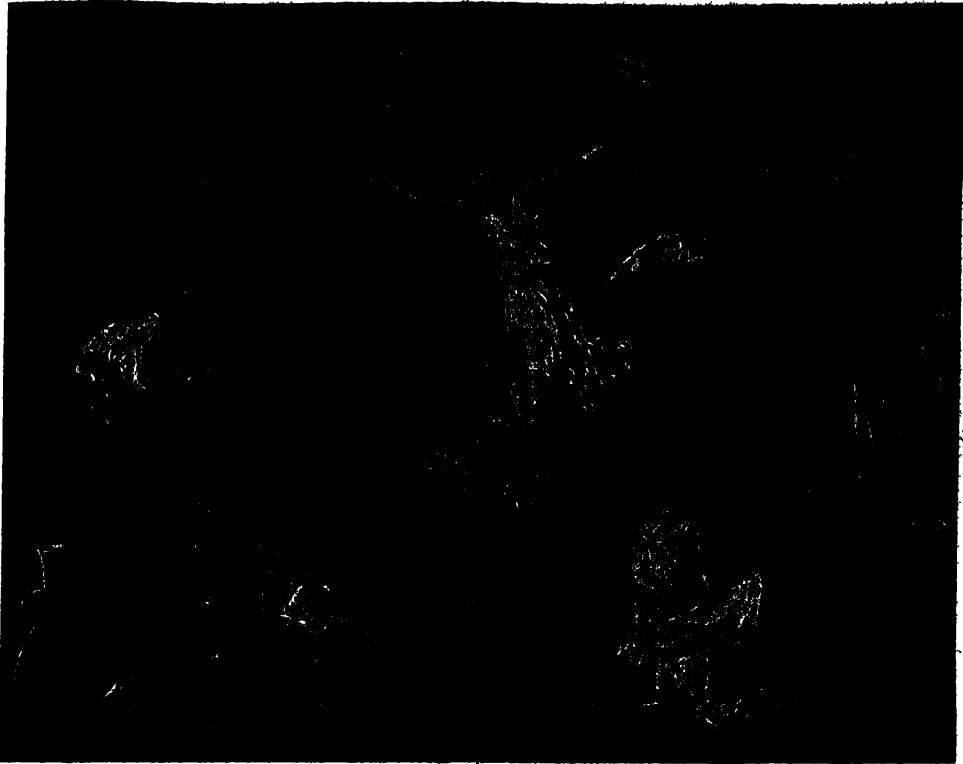
The busy spades and pickaxes, which have revealed to the eyes of men this vanished city, have brought up out of the earth much more than a collection of marbles. The ground floor of the Naples Museum is filled with monuments, but come upstairs and see a *hundred thousand things*. That is not a guess, or a mere general number; there are, indeed, a hundred thousand things, counting coins and brasses and everything

ready for cooking, peas, beans, prunes, raisins, fruits ready for dessert. Everything to eat seems to be in the room, fragments from the last dinner-tables of Pompeii, preserved through all but two thousand years by Mother Earth. And there is one thing you will not believe. There is an egg—*unbroken*! Think of it! Vesuvius destroyed this city, drove off its population, cut off at least 2,000 lives, all in an hour. It buried the city under thousands and thousands of tons of dust, buried it in the earth through all the years while Europe has been made. Vesuvius could do this, yet could not break an egg!

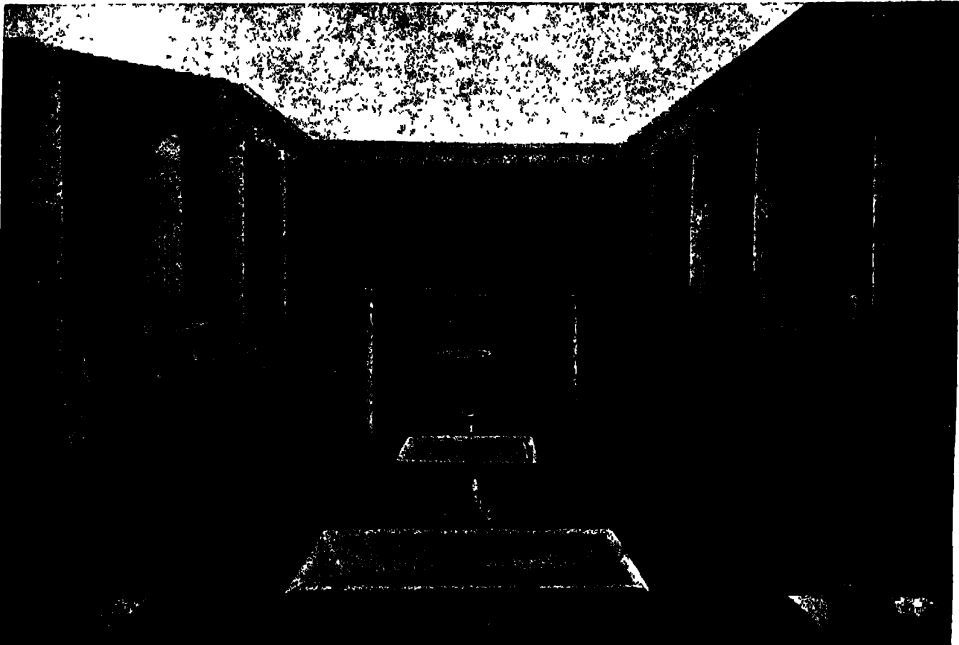
Pompeii is something to see and never to forget, for no other work of man's hands has ever been buried in the earth and come out so wonderful.

CONTINUED ON PAGE 639.

## A POMPEII GARDEN THEN AND NOW



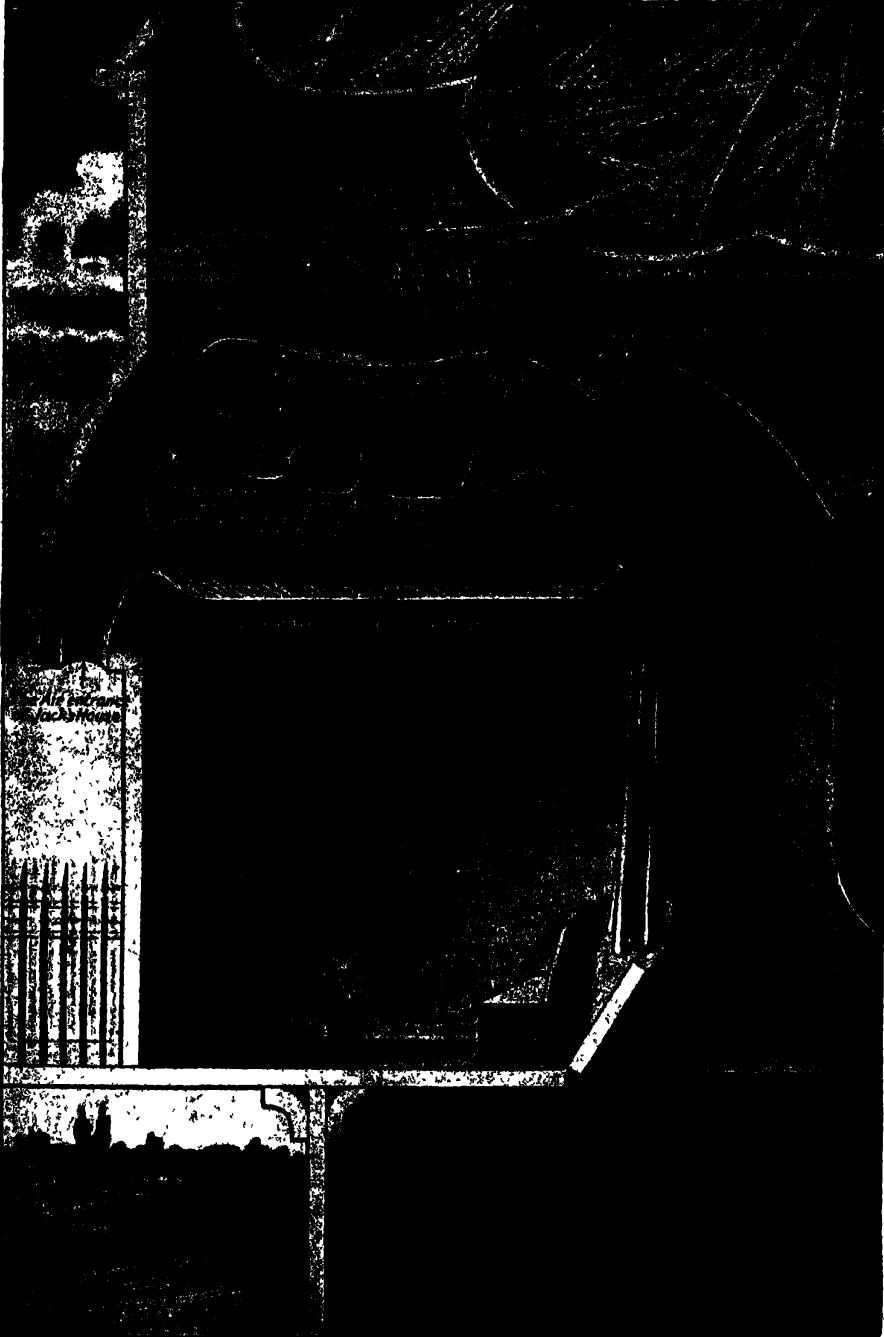
This shows life in one of the houses of Pompeii. The children are playing with their mother in a court similar to the one seen in the lower picture. - These courts, inside the house and quite separate from the outside garden, were laid out with shrubs, flowers and fountains, and adorned with sculptures.



One of the wonders of the world is the way in which Pompeii has been preserved, so that we can see much of it almost as it appeared two thousand years ago. Here is the open court of a house of the first century as it may be seen in this century. It is almost identical with its original appearance.



## WHY WE MUST BREATHE THROUGH THE NOSE



You will notice that all sensible people breathe through the nose and not through the mouth, and this picture shows us why they do so. The little hairs which line the channels of the nose act as a filter, keeping back dust and other harmful things, and the value of this filter is lost if we breathe through the mouth, and consequently allow dust and germs to have free entrance into the lungs. This picture shows also the little cells which enable us to smell. When we smell a thing, small parts of it break away and touch the cells which live on the nerves of smell, and these cells are able to detect a particle of musk that weighs only a thirty-millionth of a grain, the sense of smell being more acute even than the eye aided by the microscope.

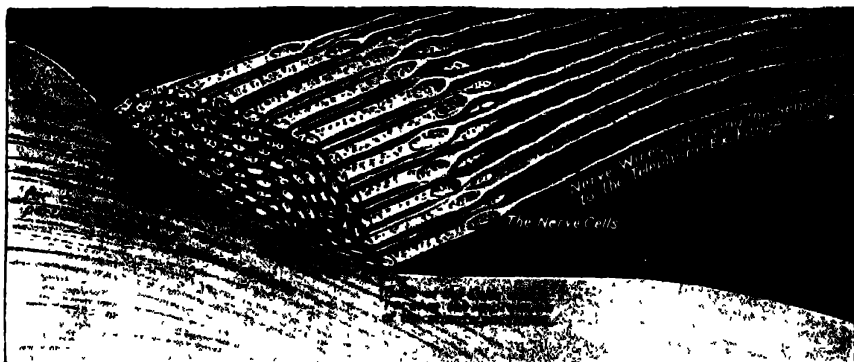


## CHIEFTAINS OF A VANISHING RACE



The red men of North America will hold sway in the vast countries where now fly the Stars and Stripes and Union Jack, or no longer. They must change their nature, or they will soon be extinct like the Aztec of South America. A brave, potent, epic race, they have always embodied among their tribes men with noble souls, noble chiefs, dead or alive today. The Last of the Mohicans, 1841.

## The Book of OUR OWN LIFE



This picture will give us some idea of the nerve-cells of smell, which line the upper part of the nose. When we smell a rose or anything else a small particle of the rose or whatever it may be is drawn to these cells, and the sensation is carried by the nerves to the brain, which recognizes it.

## JACK'S FRESH AIR SUPPLY

IF the Architect of Jack's house had forgotten to provide for its proper ventilation the house could never have been built at all. The pity is that men are allowed to build any kind of houses without providing for the breath of life to flow through them; for Jack's house has to spend much of its time in houses built by men, and if they are not properly ventilated half the value of his own ventilation system is lost.

Jack's house needs air in order that his countless living servants may breathe. If we had said *burn* instead of *breathe*, that would have been an equally true saying, for we may look upon Jack's house as a wonderful furnace, which requires a draught of air if it is to burn properly. The fuel which Jack eats, and which his chemists cook so skilfully, would be of no use to Jack unless he had a supply of air with which to burn it.

Burning, as we have already learned, means combining with oxygen which we get from the air, and this goes on everywhere all through Jack's house, and all through the houses of all living creatures, animals, or plants, whether they live in the air or at the bottom of the sea. Therefore every living thing requires and has a



ventilation system which is suited to its body.

The centre of Jack's ventilation system is Jack's middle story, where are his bellows and, as we have seen, his pump is placed. But we must begin at the beginning, and we find that a special channel has been provided, just above the front door of Jack's house, for the air to enter.

The whole of the outside of Jack's body is more or less exposed to the air, but none ever enters through his skin, though a little does enter through the walls of ordinary houses. The living houses of some animals and plants are ventilated more or less through their walls. A plant breathes all over its surface, and a frog breathes partly by its skin. But Jack depends for his air supply entirely upon what enters his windpipe, the great air tube that runs down his neck into his chest, and if he cannot receive enough air through that tube he will die.

Jack's mouth, or hall, and his nose both lead to his windpipe, and air can reach it either through his hall door or through the two holes above it called his nostrils. If Jack runs hard, or swims hard, or if he has a cold, he is bound to open his hall door, and get a larger quantity of air that way,

but as a general rule air should not be admitted through the hall at all. Unless Jack has something to say, or something to swallow, his hall door should be kept closed. The Bible rightly says that God put the breath of man's life *in his nostrils*, not in his mouth; and, indeed, Jack may well remember this very good rule—*Shut your mouth and save your life*.

It is true that it feels easier to breathe through the mouth than through the nose. Why, then, should the mouth not be used, and why is it actually dangerous to allow the front door to be constantly open for ventilation?

Well, it is dangerous for many reasons, but one of them is easy to guess, for it is the very reason which often prevents us from opening our front doors. If we carelessly leave our doors open burglars may get in; and if Jack keeps his front door open burglars will get in there too—microbe burglars which may smash and destroy his house or burn it. There are several other reasons, but we cannot understand them until we study those openings, and what is behind them.

#### THE IMPORTANCE OF THINGS YOU MAY NEVER HAVE THOUGHT OF

If we look at our nostrils we shall usually notice a number of fine hairs. They act as if they were a kind of grating or sieve, and keep back tiny flies or specks of dirt which might otherwise enter with the draught of air. Now, from the two nostrils right onwards until the air reaches the great lungs, or bellows, themselves, it has to pass one thing after another which, though we cannot see it or understand it so easily, plays exactly the part of those hairs.

When we study the inside of the nose, we find that it has various channels or passages from the nostrils to the back of the throat. Instead of being straight these passages are most crooked and twisted, so that the air can never flow through the nose without striking against the inside of it at the turns, and having to go round corners. The inside of the nose is moist, and can readily be made moister whenever the air is rather dry or cold. The nerves that govern the blood-vessels inside the nose see to that. Thus, not only is the inside of the nose crooked and moist, but it is also warm. Nor is that all. The moisture produced inside the nose by the chemists

which line its walls is distinctly poisonous to microbes. It is to some extent an antiseptic, like carbolic acid, or the acid which poisons microbes in the food when they reach Jack's great oven.

What all this means we can only learn by very carefully catching some air which has been breathed in through Jack's nose, just before it reaches his windpipe, and comparing it with the air in the room from which Jack breathed it.

#### THE FILTER THAT SURPRISES THE CLEVEREST BUILDERS

If we do this—as we can in a very wonderful way—we discover that Jack's nose is the filter of his ventilation system—a filter which does everything that can be done by the cleverest human builders, and much more besides. We can best prepare ourselves to understand and value this filter rightly by studying the construction of specimens of the best air-filters which have been made by men.

At a well-known hospital there are rooms for performing surgical operations. All the air which enters them does so through a special shaft, which it can only reach by passing through a filter. Now, this air-filter is made of a great screen of hanging cocoanut fibres, down which water is always dripping. As the air passes between these dripping fibres, it is filtered of dust and microbes to a large extent, and is also moistened. If the water were warmed, the air would also be warmed by the filter. Then a fan drives it down the shaft and into the rooms, and there the people who breathe it all filter it again, if they are wise and well, by breathing through their noses.

#### HOW THE AIR WE BREATHE IS CLEARED AND MOISTENED

The nose is the great air-filter of Jack's house, and it does just what the filter does in those beautiful rooms. But the nose is a better filter than anything man can make, and it does more for Jack's house than the cocoanut fibres and the dripping water can do.

For when we compare the air taken from the back of Jack's nose with the air outside, we find, first, that the inside air contains fewer microbes, and practically no dust, except of the very tiniest kind; and we find, next, that it is moistened, containing much more water-vapor than it did before; then we find, again, that it is warmed, for it has passed

over a large surface lined with plenty of warm blood.

How wondrously this filter of Jack's excels all the filters made by men we shall see. To begin with, not only has air to enter through this filter, but it also has to return by it.

#### THE AIR THAT TRAVELS ROUND CORNERS AND THROUGH CHANNELS

No human builder can make such an arrangement as this. He must always have an inlet shaft, where the filter is, and an outlet shaft. At the hospital the inlet shaft sends the air straight to the patient's place, and the outlet shaft is near where the lookers-on are, so that nothing can travel against the stream of air from them to hurt him. But in Jack's house the inlet shaft and the outlet shaft are one and the same, which is unlike any other system of ventilation in the world.

Now, the inlet has purposely been made difficult so that the air may be filtered and moistened and warmed. It has to flow round corners and through narrow places, but it would be an inconvenience if the air had to do this in coming out. Therefore the lowest of the three channels which we find inside the nose on each side is short and is almost straight, and we have discovered that practically all the air, on going in, travels through the middle and the upper pair of channels, but practically all, on coming out, travels by the lower pair of channels, though one pair of nostrils suffices for both purposes.

#### THINGS THAT WE NOTICE ON A VERY COLD DAY

This is really a beautiful discovery, for when first we study the shape of the inside of Jack's nose we cannot understand why the two upper pairs of channels should be so crooked and narrow, if the lower pair could let the air in. The fact is that, though the lower pair is open all the time, it and the others are just so placed that the in-draught is almost entirely through them, and the out-draught almost entirely through it. Further, if the upper and middle pair of channels are blocked, which too often happens, the lower pair still remains, and the air will do better to enter through them than through the mouth.

Indeed, this is an adaptable filter in every way. When the air is warm and

moist, it is allowed to pass quickly and easily through the filter; but when it is cold and dry, and would do harm inside Jack's house, it is compelled to pass more slowly, and is exposed to more warmth and more moisture.

This beautiful arrangement is worked by those servants of Jack who sit in his upper story, and control, by nerves, the size of every blood-vessel in his body, as the train despatchers in their tower control the traffic over the railway tracks which run in and out of the railway station. When they get messages saying that the air is rather too dry and cold, they give orders to flood the lining of his nose with warm blood, by relaxing the walls of all the blood-vessels inside it.

#### THE FILTER THAT POISONS ITS ENEMIES

In order that the orders shall be effective, we find that the lining of Jack's nose is extremely loose on the bony walls, and so it can be stretched and filled with a great quantity of blood whenever it is feared that Jack is being supplied with air so cold and dry that it would injure the inside of his bellows.

We have seen that the inside of the filter produces something that poisons many microbes. When we blow our noses—which we should do more respectfully after learning what our noses are!—we clear the filter of a mixture of dirt, dust, and microbes, and if we consider how soon a used handkerchief becomes unpleasant, we realize what might happen to our lungs if we had no filter to breathe through.

But if we examine the lining of this filter with a microscope, we find still more wonders such as no other filter can show. Nearly the whole of its surface is covered with tiny living servants of Jack—cells which produce a steady flow of moisture to purify the air. These cells have a sort of hairs—called *cilia*, which is Latin for eyelashes—sticking out from them into the air-channel. These cilia form a sort of broom, which the cells that bear them keep brushing in one direction, so as to keep the filter clean. Their action never stops, even when we sleep, but goes on night and day.

These ciliated cells line the whole of Jack's ventilating shaft, from the nostrils down to the bellows, or lungs, themselves. When Jack has a "cold," and especially

when he has bronchitis, he loses the services of these excellent servants for a time, for multitudes of them are killed by the microbes that have succeeded in getting past the sentinels and have made Jack ill. Not until new ones take their place is Jack quite comfortable. One other interesting fact about these cells is that, like the white cells of the blood, which have wonderful powers of movement also, they are independent of Jack's officials in his upper story. No nerves order them about, and they move as they know they should, on their own account.

Very different are the cells which line one special part of Jack's nose, just where the incoming current is strongest. They are not merely connected with nerves, but are themselves nerve-cells.

#### THE SERVANTS WHICH GIVE JACK THE SMELL OF A ROSE

These servants of Jack are of a far higher kind than the cells which wave their cilia. They do not show, under the microscope, anything so wonderful as the "ciliary movement" of the other cells, but their power of feeling is really far higher and far more wonderful. When certain gases or particles of material come in with Jack's air-current and reach these sentinels, they are known and recognized as good or bad, or as not mattering one way or the other; and this smelling, as we call it, is done by the smell-sentinels in Jack's nose, together with a part of his brain, with a special kind of nerve-cells, which are experts at smelling, and can communicate with every other part of Jack's brain.

As a matter of fact, Jack's house is far from being as well supplied in this respect as the house of his dog. In human beings, the sense of smell has lost most of its importance, and the marvelous sentinels for seeing and hearing have taken the place of smell for most purposes—such as recognizing Jack's friends and enemies.

Nevertheless, these sentinels that line the upper part of the air-filter are not to be despised, even though they are stupid in comparison with the smell-sentinels of many animals.

#### SENTINELS THAT MAY SAVE JACK'S LIFE

These little servants can still recognize many bad things. For instance, if the gas has not been properly turned off at night, Jack's sentinels tell him that it is

escaping, for they recognize some of it in the air-current which passes them. But for this warning Jack might go on, breathing the gas until it overcame the unsleeping cells that govern his bellows, and he would stop breathing for ever and would wake up from sleep no more.

Also these sentinels give Jack much pleasure in the sweet scents of flowers in the country; and they are very useful in helping him to enjoy his food, for the scent of his food gets into his nose, and, indeed, a good deal of what he calls the taste of his food is not really taste at all, and should go, not to the credit of his hall porter, but to that of the sentinels in his nose. The best proof of this is that Jack has a very dull taste of food when he has a cold, and the smell-sentinels are drowned in fluid for a time, so that the smell of the food cannot reach them and his favorite dishes seem to him dull and unpalatable.

#### THE LITTLE TUBE OF AIR THAT HELPS US TO HEAR SOUNDS

Lastly from each side of this filter there runs a tube which carries a little air to the inside of Jack's ear so that there is air inside as well as outside Jack's ear-drums, and sounds can move them freely. This tube has a long difficult name—the Eustachian tube. The name was given to it in honor of a famous Italian named Eustachio who lived in the eighteenth century. This great man found out what a faithful servant this tube is in Jack's house.

Such is Jack's filter. If it is not in good working order—as when part of the lining is overgrown and he has adenoids—he becomes a "mouth-breather," and suffers in many ways. No one can afford not to use this living filter, which stands at the beginning of the ventilation system, and without which Jack's house can never be as clean and habitable and durable as it should be.

If Jack is to gain the full benefit of this wonderful filter, unless when he is talking or shouting, he will always breathe with his mouth shut, whether he wakes or sleeps. If he does this, almost all the air that enters his house will be cleansed and purified, and the tiny enemies that would take away his health will be stopped at the outer gates by the trusty sentinels who stand on guard.

CONTINUED ON PAGE 6307.

## The Story of FAMOUS BOOKS

### A FAMOUS BOOK ABOUT A FAMOUS VOYAGE

**R**ICHARD HENRY DANA was a member of a distinguished family of Boston, and, as he tells us, made the voyage around the Horn for his health while a student at Harvard. His book tells of the life of a common sailor, of the strange Spanish land of California, of the manners and customs of the people, and of his thoughts and feelings on the voyage. Sailing ships had almost disappeared when the Great War began, but it has called some of them back. This book is one of the best descriptions we have of life on one of these vessels in the first half of the last century. After Mr. Dana's voyage he returned to his studies, was graduated at Harvard, and later became a famous lawyer. He wrote a book for sailors telling them what their rights were, and to the end of his life was interested in the sea, and in sailors. This book is read as much to-day as when it was first published.

## TWO YEARS BEFORE THE MAST

**RICHARD HENRY** DANA, when an undergraduate at Cambridge, determined to take a long sea voyage in order to cure a weakness of the eyes which threatened to spoil his career. Accordingly he shipped on the brig *Pilgrim*, bound from Boston round Cape Horn to the western coast of North America, a long and tedious voyage. The first day at sea the captain of the ship addressed the crew as follows: "Now, my men, we have begun a long voyage. All you've got to do is to obey your orders and do your duty like men,—then you'll fare well enough;—if you don't, you'll fare bad enough, I can tell you. That's all I've got to say. So below, the larboard watch."

Dana was utterly new to the sea, and felt very keenly all the discomforts of a sailor's life. At first he lived in the steerage, which was filled with coils of rigging, spare sails and old junk. There were no berths built into the sides, no nails for their clothes, no light allowed to find anything with, and the rolling of the ship pitched everything about in great confusion. In the darkness and noise the new sailor had the added misery of seasickness. While in this state he was first ordered aloft to reef topsails, and

the wonder is that he did not pitch headlong upon the deck. So matters continued for two or three days till the weather bettered, and Dana was able to take good solid rations of salt beef and biscuit. From that time he was a new being. By degrees the strange names of things on board became familiar to him, and he entered upon the regular duties of sea-life.

He soon realized what a busy life this was which he had adopted. The discipline of the ship required every man to be constantly at work when he was on deck, except at night and on Sundays. When not actually engaged in sailing the ship, the vessel was overhauled and repaired by the men. Her running gear had to be kept, at all times, ready for any emergencies. When it was not the sails, then it was the rigging which needed examining. All the yarn used on board a ship for the numberless ropes or yards that showed signs of wear had to be made on board, and the mending of this "chaling-gear," as it was called, gave constant employment during the entire voyage. Added to this was all the tarring, greasing, oiling, varnishing, painting, scraping and scrubbing required in the course of a long voyage. On wet days, instead



of allowing the men to stay in sheltered places at work they were separated in different parts of the ship and kept busy picking oakum. All these things young Dana was to find out during the long months of the journey, when the monotony of the days was broken only rarely by the sight of a sail.

Through the late summer and autumn the ship ran on with few adventures upon her southerly course towards Cape Horn. Once they were chased by pirates for a day and a night, but escaped by spreading more sail, and putting out all lights on board at nightfall. In the latitude of the La Plata the first of the gales struck the brig, and early in November they sighted the Falkland Islands, as they ran between them and the mainland of Patagonia. They were now in the region of Cape Horn and saw the Magellan Clouds and the Southern Cross, the latter the brightest stars in the heavens. All were prepared for the dreaded Cape weather and it did not delay its onslaught upon them. A fine specimen of it appeared in a great cloud of dark slate-color which drove upon them from the southwest; in an instant the sea was lashed into a fury and it became almost as dark as at night. The sailors did their best to take in sail, but a cold sleet and driving hail almost froze them to the rigging, while the sails were stiff and wet, and the ropes and rigging covered with sleet and snow. The little brig plunged madly into this tremendous sea, and wave upon wave rushed in through the portholes and broke over the bows. An order was given to furl the jib, the sail forward of the foremast, and two of the men had to go out on the bowsprit. An old Swede (the best sailor on board) sprang forward and Dana followed him. As the vessel plunged downward the men were submerged in the sea up to their chins, and for some time could do nothing but hold on. No help came to them from the decks, for the fury of the wind and the breaking of the seas against the bows prevented any shout from being heard. At last they succeeded in furling the jib, after a fashion, and came in to find all snug and the watch gone below, for they were soaked through and very cold.

Day after day passed with but little change in the weather. The men's clothes were all wet through and they

had no means of drying them, and could only change from wet to wetter. They could not read or work below, for the hatches were closed and everything black and dirty. Their only relief was to come below when the watch was out, wring out their wet clothes, hang them up and turn in and sleep until the watch was called again. At night and morning they were allowed a tin pot full of hot tea sweetened with molasses, which, bad as it was, was the only warm food they had, and which with their sea biscuit and cold salt beef comforted them somewhat. One of their shipmates then fell overboard heavily dressed with heavy coils of rope around his neck. He could not swim and probably sank immediately. This depressed the sailors seriously, for the man had been a fine seaman and a good shipmate, and one out of their little company was seriously missed. As was the custom, the captain immediately held an auction of his things, and in this way the trouble and risk of keeping them through the voyage were avoided, and they were generally sold for more than they were worth ashore.

At the end of November they sighted land and made out the island of Juan Fernandez rising like a deep blue cloud out of the sea. The captain and some of the crew went ashore to get fresh water, and they found that the island was used by the Chilean government as a convict settlement, with a governor, a priest, half a dozen taskmasters, and a body of soldiers to keep the prisoners in order.

They saw neither land nor sail from the time of leaving Juan Fernandez until their arrival in California. Dana's lot was lightened by being allowed to shift his berth from the steerage into the fore-castle and bunk and mess with the crew forward. The weather in the Pacific was fair and the climate never extremely hot or cold. At last, early in January, they came to anchor in the spacious bay of Santa Barbara after a voyage of one hundred and fifty days from Boston.

The brig expected to trade upon the coast of Upper California, but instead of going first to Monterey, the seat of government and only custom house, where the cargo had to be entered, the captain had orders to put in at Santa Barbara and wait for the agent, who lived there and transacted all the business for the firm. Accordingly as soon as they had

picked him up they set off for Monterey. The weather had changed again and for four days of rainy, stormy weather they beat up the coast against a violent head wind. After some delay they entered the Bay of Monterey and found good anchorage where they could lie safe from the "southeasters," which were the chief difficulty on this coast.

Then the trading began. A room was fitted up in the steerage, and the men, women and children were rowed out to the vessel to look at the cargo and make their purchases. The Pilgrim's cargo consisted of everything under the sun—from Chinese fireworks to English cart-wheels—and everything was sold very dearly, partly because of the heavy duties laid upon imports, and partly because of the great expense of the long voyage. The ship's crew was busy from daylight until dark in the boats, carrying goods and passengers, for everybody made a holiday to come on board and see the strange vessel even if they only bought a packet of pins. Thus engaged the men gained considerable knowledge of the character, dress and language of the people, and Dana himself borrowed a grammar and dictionary from the cabin and soon got the name of a linguist among the crew.

As soon as the trade slackened at Monterey the brig left for Santa Barbara, and there the crew had their first glimpse of what taking up their own cargo would mean. They had come for hides, and had supposed when they left Boston that it was on a voyage of eighteen months or two years at most. It was found that the hides were scarce and yearly becoming scarcer, and it would take a year at least to collect their own cargo; in addition, they learned for the first time that they had also to collect a cargo for a large ship belonging to the same firm which was soon to come up the coast. The gloomy prospect of two or three years at the end of the earth, on a coast almost solitary, and in a country where there was no law, hung over the ship and the men became miserable and indifferent. Trouble was brewing and nothing went right. The captain quarreled with the cook, and disputed with the mate, and finally tied two men up to the shrouds and cruelly flogged them for fancied insolence. After this the comfort of the voyage was at an end.

The book is one of the best descriptions we have of life in California under Mexican rule, for the state did not become a part of the United States until fifteen years after Dana's voyage. Scattered through it there are many incidents of persons and places which enable us to understand the country of those days, when there were few white men in the whole region. Those of unmixed Spanish blood called themselves Castilians, and were very proud of the fact. Most of them, however, were part Indian. The Indians themselves were little more than slaves. Little farming was done, but there were great herds of cattle and horses. A good horse could be bought for ten dollars or less, and the cattle were chiefly valued for their hides and tallow. Thousands were killed for these alone, and of course fresh meat was sold for almost nothing.

For some time the brig cruised up and down the coast, collecting hides till she had as many as her hold would carry, and she then sailed to San Diego, where the firm had a hide-house built to hold forty thousand hides. There was not a man on board who did not go a dozen times into the house, and look around and make a calculation of the time it would require to fill it. As the hides came rough and uneven from the vessels they were piled outside the house and then carried through a regular course of pickling, drying and cleaning, in order that they might keep during a warm voyage. For this purpose an officer and some of the crew were left ashore and Dana was among the shore gang. He and the others made their home in one corner of the large hide-house, which was boarded off, and in which there were berths, a table, a small locker for pots and spoons, and a hole cut to let in the light. The officer had a similar small room where he lived in state.

His companions on the beach, other than the ship's crew, were, for the most part, Sandwich Islanders, or, as they called themselves, "Kanakas." Dana liked these men for their kind-heartedness and intelligence and soon learned to speak their language, though they had no books and very little education. Whatever one of these men had, they shared with the others,—money, food, clothes, even to the last pipe of tobacco to put in their pipes. Then there was a

of allowing the men to stay in sheltered places at work they were separated in different parts of the ship and kept busy picking oakum. All these things young Dana was to find out during the long months of the journey, when the monotony of the days was broken only rarely by the sight of a sail.

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Day after day passed with but little change in the weather. The men's clothes were all wet through and they

had no means of drying them, and could only change from wet to wetter. They could not read or work below, for the hatches were closed and everything black and dirty. Their only relief was to come below when the watch was out, wring out their wet clothes, hang them up and turn in and sleep until the watch was called again. At night and morning they were allowed a tin pot full of hot tea sweetened with molasses, which, bad as it was, was the only warm food they had, and which with their sea biscuit and cold salt beef comforted them somewhat. One of their shipmates then fell overboard heavily dressed with heavy coils of rope around his neck. He could not swim and probably sank immediately. This depressed the sailors seriously, for the man had been a fine seaman and a good shipmate, and one out of their little company was seriously missed. As was the custom, the captain immediately held an auction of his things, and in this way the trouble and risk of keeping them through the voyage were avoided, and they were generally sold for more than they were worth ashore.

At the end of November they sighted land and made out the island of Juan Fernandez rising like a deep blue cloud out of the sea. The captain and some of the crew went ashore to get fresh water, and they found that the island was used by the Chilian government as a convict settlement, with a governor, a priest, half a dozen taskmasters, and a body of soldiers to keep the prisoners in order.

They saw neither land nor sail from the time of leaving Juan Fernandez until their arrival in California. Dana's lot was lightened by being allowed to shift his berth from the steerage into the fore-castle and bunk and mess with the crew forward. The weather in the Pacific was fair and the climate never extremely hot or cold. At last, early in January, they came to anchor in the spacious bay of Santa Barbara after a voyage of one hundred and fifty days from Boston.

The brig expected to trade upon the coast of Upper California, but instead of going first to Monterey, the seat of government and only custom house, where the cargo had to be entered, the captain had orders to put in at Santa Barbara and wait for the agent, who lived there and transacted all the business for the firm. Accordingly as soon as they had

picked him up they set off for Monterey. The weather had changed again and for four days of rainy, stormy weather they beat up the coast against a violent head wind. After some delay they entered the Bay of Monterey and found good anchorage where they could lie safe from the "southeasters," which were the chief difficulty on this coast.

Then the trading began. A room was fitted up in the steerage, and the men, women and children were rowed out to the vessel to look at the cargo and make their purchases. The Pilgrim's cargo consisted of everything under the sun—from Chinese fireworks to English cart-wheels—and everything was sold very dearly, partly because of the heavy duties laid upon imports, and partly because of the great expense of the long voyage. The ship's crew was busy from daylight until dark in the boats, carrying goods and passengers, for everybody made a holiday to come on board and see the strange vessel even if they only bought a packet of pins. Thus engaged the men gained considerable knowledge of the character, dress and language of the people, and Dana himself borrowed a grammar and dictionary from the cabin and soon got the name of a linguist among the crew.

As soon as the trade slackened at Monterey the brig left for Santa Barbara, and there the crew had their first glimpse of what taking up their own cargo would mean. They had come for hides, and had supposed when they left Boston that it was on a voyage of eighteen months or two years at most. It was found that the hides were scarce and yearly becoming scarcer, and it would take a year at least to collect their own cargo; in addition, they learned for the first time that they had also to collect a cargo for a large ship belonging to the same firm which was soon to come up the coast. The gloomy prospect of two or three years at the end of the earth, on a coast almost solitary, and in a country where there was no law, hung over the ship and the men became miserable and indifferent. Trouble was brewing and nothing went right. The captain quarreled with the cook, and disputed with the mate, and finally tied two men up to the shrouds and cruelly flogged them for fancied insolence. After this the comfort of the voyage was at an end.

The book is one of the best descriptions we have of life in California under Mexican rule, for the state did not become a part of the United States until fifteen years after Dana's voyage. Scattered through it there are many incidents of persons and places which enable us to understand the country of those days, when there were few white men in the whole region. Those of unmixed Spanish blood called themselves Castilians, and were very proud of the fact. Most of them, however, were part Indian. The Indians themselves were little more than slaves. Little farming was done, but there were great herds of cattle and horses. A good horse could be bought for ten dollars or less, and the cattle were chiefly valued for their hides and tallow. Thousands were killed for these alone, and of course fresh meat was sold for almost nothing.

For some time the brig cruised up and down the coast, collecting hides till she had as many as her hold would carry, and she then sailed to San Diego, where the firm had a hide-house built to hold forty thousand hides. There was not a man on board who did not go a dozen times into the house, and look around and make a calculation of the time it would require to fill it. As the hides came rough and uneven from the vessels they were piled outside the house and then carried through a regular course of pickling, drying and cleaning, in order that they might keep during a warm voyage. For this purpose an officer and some of the crew were left ashore and Dana was among the shore gang. He and the others made their home in one corner of the large hide-house, which was boarded off, and in which there were berths, a table, a small locker for pots and spoons, and a hole cut to let in the light. The officer had a similar small room where he lived in state.

His companions on the beach, other than the ship's crew, were, for the most part, Sandwich Islanders, or, as they called themselves, "Kanakas." Dana liked these men for their kind-heartedness and intelligence and soon learned to speak their language, though they had no books and very little education. Whatever one of these men had, they shared with the others,—money, food, clothes, even to the last pipe of tobacco to put in their pipes. Then there was a

large number of dogs, who were useful in guarding the beach at night. These same dogs, and a few chickens, made up the entire population of the beach.

The men turned out every morning at the first signs of daylight, and allowing a short time for breakfast, got through their labor between one and two o'clock, for there was a regular amount of work to do each day, and when that was done the time was their own. Just before sundown, the dry hides were beaten and put in the house and the others in their various stages of preparation covered over. The evenings were their own and were usually spent at one another's homes. The work was hard, disagreeable and tiring, but they became hardened to it, and the feeling of freedom made up for much. Through the season other vessels came to the beach to discharge or pick up hides, and the crews came ashore every evening and made a varied gathering from almost every country under the sun. The Pilgrim, too, from time to time brought fresh cargoes of hides, and the news that the company's large ship, the Alert, had arrived, and that their own captain had taken charge of her and gone up to Monterey with her.

Dana was becoming very anxious as to his own future. If he had to stay with the Pilgrim for four years, his chances of another career would be gone forever, for he would be a sailor in tastes and nautical knowledge, and his companions at college would have gone on and left him far behind. He became then eager, as indeed were all the crew, though for different reasons, to get home. But if the worst came to the worst and he was forced to stay at sea the best he could do was to qualify himself for an officer, and for that purpose must learn practical seamanship on board ship, and must leave his hide-curing and join in the cruising upon the coasts. When the Alert arrived he obtained permission from the captain to exchange with one of the crew and accordingly entered upon a new life at sea once more.

The new ship was better in many respects than the Pilgrim, in order and cleanliness, in discipline and good feeling. Dana had mended and generally overhauled his wardrobe during his time ashore and in spare time now had nothing to do but read when he could find a rare book among the chests of the crew.

But this was too good to last and rough weather came on, when all hands were ordered on deck to make or trim sail, and the men's clothes got wet through again as they had done off Cape Horn, and again there was no place to dry them. So the winter through there was little difference in the seasons, and the months were given up to collecting the tale of hides that the company expected and taking them down to the hide-house to be prepared for the voyage.

At last in March came the first assurance that the voyage was really drawing to a close. The captain gave orders for the ship to go down to San Diego, to discharge everything from the ship, clean her out, take in hides, wood, water, etc., and set sail for Boston. There followed six or eight weeks of the hardest work they had yet seen, from the gray of the morning till starlight, with only just time to swallow their meals. The hides were stowed in the hold by hand, and then "steved" or forced down, by which a hundred hides are pressed into a place where one could not be forced by hand. The crew was a cheery one, and filled with the hope of home, and songs rose and fell in tune with the work. All this time they lived upon nothing but fresh beef,—fried beefsteaks three times a day,—morning, noon, and night. A whole bullock lasted but four days, but all were in perfect health and needed the heavy food to keep up with the heavy work and exposure.

The Pilgrim was not returning to Boston, but Dana knew that the owners through the influence of his friends had arranged for him to go back in the Alert and his heart was easy. One day he received a summons into the cabin, and going aft found his own captain and the agent there. Captain T—— turned to him.

"Dana, do you want to go home in the ship?" he asked.

"Certainly, sir," Dana replied. "I expect to go home in the ship."

"Well," said he, "you must get some one to go in your place on board the Pilgrim." Such a blow was so unexpected that for a moment Dana was completely taken aback. As soon as his wits came to him he told the captain plainly that he had a letter in his chest informing him that the owners had written the captain to send him home in the

Alert. His firmness enraged the captain, and had he been friendless and poor, there is no doubt that he would have been condemned to spend two more years in California.

With over forty thousand hides, thirty thousand horns, and barrels of otter and beaver skins, the Alert pulled up anchor and set sail. The ship was only half manned, and loaded so deep that every heavy sea washed her fore and aft, the forecastle leaked, and the journey round the Horn had to be made in the depth

As the ship neared the home port, great preparations went ahead to make her trim. The rigging was set up and tarred, the masts stayed, the ship scraped and painted inside and out. After a voyage of one hundred and thirty-five days they came up the harbor and by night lay snug, with all sails furled, safe in Boston Harbor, the long, perilous voyage ended.

In those days the life of the common sailor was very hard. The captains had absolute power and many were brutal and cruel. The members of the crew could



This is a picture of State Street, Boston, at the time that Dana made his famous voyage. The old State House still stands, but the other buildings are different. Costumes have changed as well as everything else.

of winter, yet the men made the best of it, though drenching rain kept them in a state of perpetual discomfort, and scurvy made its ravages upon the crew. All fresh food soon gave out and things were beginning to look bad when they hailed a brig outward bound from New York which gave them potatoes and onions and thus arrested the progress of the dread disease. Scurvy is hardly known these days, but then it was common. It is caused by a lack of fresh fruits or vegetables. Then salt provisions were the usual food, and prisons and ships often had many cases. Now fresh meat can be carried in the ice chest, and more attention is paid to carrying vegetables.

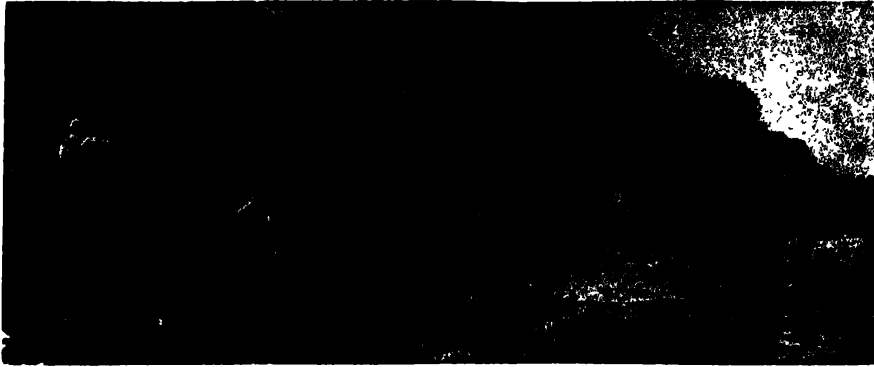
do nothing in self-defence while on ship, and except in a case of unprovoked murder, their complaints on shore had little effect. In the story we find many instances of the harshness which sailors were compelled to endure. Sick men were neglected, or set to work when too weak to stand. Everything in the way of clothing the sailor bought from the ship was charged to him at a very high price, and he was lucky if he had any of his wages left when the ship reached the home port after a long voyage. He was compelled to get another ship at once, where he was likely to be just as badly off. It is not surprising that the common sailor was careless and reckless.

## A DASH AFTER BIG GAME IN THE JUNGLE



### THE HUNTSMAN, HAVING APPROACHED NEAR, MAKES A DASH UPON THE ANIMALS

Giraffes, zebras, elands, and other animals of this kind, always take to flight at the least sound. The hunter who wants to catch them alive has to be very cautious. He approaches them carefully, making no noise, and, keeping himself well out of sight till he is near, rushes out and overtakes the younger animals, that cannot run so fast as the older ones. It is the young animals that are wanted, as they easily adapt themselves to a life of captivity, whereas the older ones remember and pine for the freedom of the wilds, and quickly die.



YOUNG WILD ELEPHANTS BEING LED CAPTIVE BY TRAINED ANIMALS

## THE HUNTERS OF THE WILD HOW THE ANIMALS CAME TO THE ZOO

WHEN we spend a day at the Zoological Park, in New York, and see the enormous number of animals, birds, and reptiles there, we cannot but feel that we have around us a little model of the whole animal world. Of course, there are still many species of animals and birds not represented, for there are many which it is impossible to keep alive in captivity. However, we have before us a collection drawn from all quarters of the world.

They have come from the vast spaces of Australia, from the jungle of India, from the sub-tropical forests of South America, from the rolling prairies of North America, from the burning plains of Africa, from the frozen North, from the little islands where it is always summer; they are taken from the wild highlands of Tibet, from the steep sides of the Alps, from caves and burrows, from the air, and from the sea.

Many of the animals, after their capture, have made long journeys on foot through the desert, have been carried in ships across the sea, and have been treated on their way with as much care and anxiety as if they were royal princes. There are many

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other zoos like the one in New York, not all so well stocked, but still good. There are several good collections in the United States and more than forty in Europe, to say nothing of private collections and a host of menageries.

To get together great families of animals such as these needs a world-wide system of hunting. We can see that this must be so when we look at the elephant, the rhinoceros, and the hippopotamus, with their huge bulk and terrible strength; the lions and tigers and leopards, with their savage natures, their strength, and speed; the bears, with their fierce, slow strength; the monkeys, with their agility and cleverness; the snakes, with their deadly powers.

Probably his own misfortunes first taught man how to capture animals more powerful than himself. The men of old times saw mammoths and other great creatures made prisoners by the marshes into which they wandered; and, desiring food, these men gathered their forces and attacked the imprisoned animals where they were. Then, having practised this for some time, they easily learned how to catch these animals by making



traps for them, simply by digging a pitfall into which the creatures fell. To this day we employ this method for the capture of many of the animals which come to our zoos, particularly for the rhinoceros and the hippopotamus. Men often shoot the parent animals, and capture the young ones as best they can. But the methodical hunter lays his plans more deliberately.

#### HOW THE HIPPOPOTAMUS AND RHINOCEROS ARE TRAPPED

As we already know, the mother hippopotamus, when she takes her young one out from home to drink at a pool, sends him on ahead, while she brings up the rear, carefully looking out for danger. The hunter seeks the well-beaten paths in the reeds or grass or bushes leading to and from the water which the hippopotamuses take. When he has found one he digs a pit in it and covers it over with boughs. The baby hippopotamus and the mother trot along, and suddenly, as the youngster puts his foot down, the earth seems to open under him, and he disappears from sight.

Now, if it were an open enemy which had attacked her little one, the mother would charge him with all her strength, but this disappearance is so mysterious that she turns round and bolts for home. The hunters come up, slip a noose over the head and front feet of the little one, then raise him from his prison, tie all four legs, and bind him up so that he can be carried away.

#### A TAME RHINOCEROS AND ITS FRIENDS

Much of the same plan is adopted for the snaring of the young rhinoceros, but here the difficulties are less, for the young rhinoceros is a better-tempered fellow than the other, and can soon be taught to follow his captors like a dog. A rhinoceros captured in Africa at once made friends with a tame goat, a vulture, a stork, and a baboon, and all the way down to the coast these friends were not to be separated. Especially was the young animal friendly with the goat, for it was upon the milk of this creature that it was first fed. The rhinoceros was taken to Germany, but its captors had to send the goat with it, and when it was last photographed it had grown to be quite a big rhinoceros, while the goat was the proud mother of two kids, which also lived with the rhinoceros.

Most of the lions which we see in zoos and menageries were captured when young, though many are born in captivity. They are not taken without a struggle, unless they are very young, for when only six weeks or two months old they make a brave fight for liberty. Therefore, the hunters generally throw a net or cloth over them.

If they are very young, they have to be reared by the kind attention of some other animal. For this purpose goats and kind-tempered dogs are used. Naturally, these animals are a little alarmed at first at the rough and fierce manners of their foster-children, but there is a marvelous power of friendship between a mother animal and baby animals, even if the baby animals are of an entirely different order.

The same practice applies to the capture of tigers as to that of lions. When full-grown lions or tigers have to be taken, it is a much more serious business. Many hunters make the old pitfall; then, when the animal has tumbled in, they lasso its feet and head, and throw a net over it. But often the animal injures itself in its fall, and dies.

#### A GIANT MOUSE-TRAP SET TO CATCH A BEAST OF PREY

The safer way, therefore, is to set a sort of gigantic mouse-trap. The door leading into the cage is held up by a spring. When the lion or tiger enters, and takes the bait, the spring is released and the door shuts down with a bang. Sometimes a lion, with more cunning than its fellows, suspects one of these traps, and, instead of walking into it, lies down and hides outside in waiting for the men who set the trap. One lion which was trapped got one of its paws shut in by the door, and when the hunters came up to secure the animal, it made a tremendous effort, burst open the trap, and, springing out, killed two of its would-be captors.

The same sort of trap serves for the leopard, the hyena, and the wolf, though the American master of craft, the wolferine, has been known to travel forty miles, stealing the bait from trap after trap set to catch it, and never once entering one of them.

#### THE SWIFT CHEETAH FAMOUS AMONG INDIAN HUNTERS

The cheetah is one of the animals most commonly trapped in India, where

## WATCHING FOR THE WILD ELEPHANTS



The capture of wild elephants alive is a very exciting business, and months are occupied in preparing for the hunt. A great enclosure is built, and hundreds of natives, armed with rifles, drums, and firebrands, surround the haunts of the elephants, and, by frightening them with noise and fire, drive them into the enclosure, of which we see a corner in this picture. They are afterwards secured and tamed.



The driving of the wild elephants into the enclosure is watched by Europeans from a platform built high up in a tree. Any number up to a hundred elephants may be caught at one time in this way. When they have been in the enclosure for some time, tame elephants, which have been trained for the purpose, are driven in, and these occupy the attention of the captives while their legs are being tied to tree-trunks by natives.

the native princes keep packs of these animals for hunting. An interesting thing is that cheetahs, to be good hunters, must be caught wild; those which have been born in captivity are worthless for the work. The natives have a peculiar way of catching these animals. Grown-up cheetahs are wanted, and the grown-up cheetah is the fastest runner in the world. Probably the fleetest thing on legs, next to itself, is the swiftest of antelopes. Should a cheetah see an antelope two hundred yards away, it runs with such amazing speed that it can catch the antelope before it has run four hundred yards. Luckily for the antelopes, the cheetah can run only for a short distance.

When wild, the cheetah, after killing an animal, retires to some secluded spot to sleep off the effects of its meal. When it is hungry, it goes to a place where many cheetahs meet, generally in the neighborhood of a tree. The natives tie running nooses to this tree, and the cheetah gets its head fast in one of these and so is easily captured.

### CATCHING THE GIANT GIRAFFE

When men set out to catch giraffes or deer, elands, and other animals from which little or no danger to themselves is to be feared, they approach very cautiously and quietly as near as possible to a herd, then suddenly dash out on their horses into the open in pursuit. Away go giraffes, zebras, and gnus, and gazelles, and antelopes in company. There are young ones with them, and it is these that the men capture. They

really do not want the old ones, for they would be likely to die. Many animals do die in this way, from a mixture of fright and sorrow. The young of wild animals, however, are like children; though they may feel their griefs acutely for the time being, they soon forget the bitterness of their sorrow. The young ones are introduced to cows or motherly goats, which, after a few protests, give the little things all the milk they need, and so fortify them for the long march

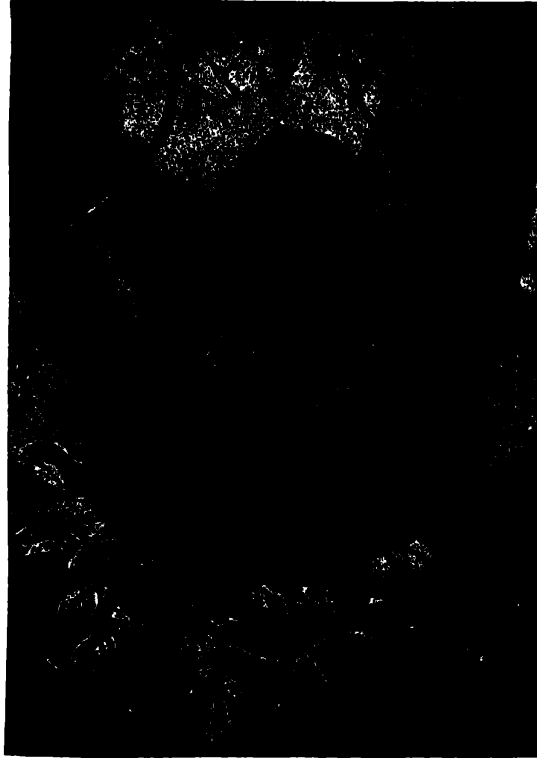
which they will have to make night by night, when the hot sun is out of sight, down to some seaport.

### THE FIERCE GORILLA THAT DIES WHEN IT LOSES ITS FREEDOM

Men have caught species of nearly all the known apes and monkeys. Yes, even young gorillas and chimpanzees and gibbons have been taken. Hunters have never yet managed to take an adult gorilla alive, and probably never will, so fearful is its strength, so unyielding its ferocity. If they did,

it would probably die by starving itself. Even the little ones cannot be kept alive, so homesick are they, and so delicate through the change of climate and of food. No gorilla has had a longer life in captivity than the famous one that lived in the Bronx Zoo for almost a year.

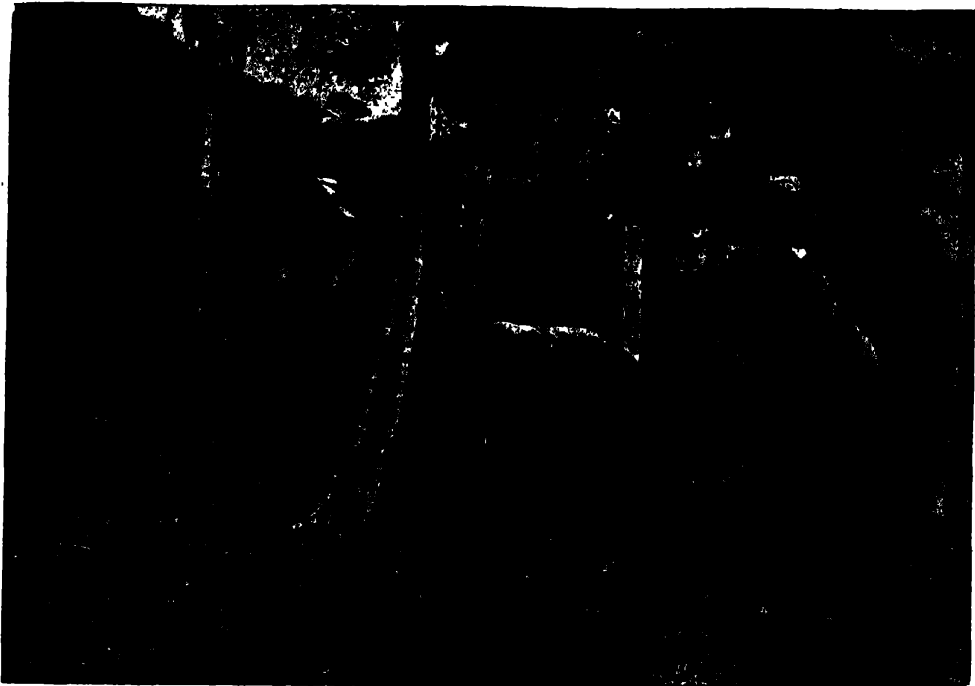
Hunters find it easy to catch monkeys and baboons. There are all sorts of ways of catching monkeys, for they are great thieves, and will go wherever food is to be got. In India the monkey is sacred, because an old tradition tells that a monkey god helped to do a great work for the people of the country.



THE GORILLA IN A TREE

No man has ever caught a grown-up gorilla alive.

## A WILD ELEPHANT BEING TIED TO A TREE



Tame elephants are very skilful in assisting hunters to tie captured animals, and they seem to enjoy the business thoroughly. They entice the captives near suitable trees, and all through show almost human intelligence. Here two tame elephants are leading a young wild one to a tree, while a man is about to put a rope round the captive's leg. Tame elephants sometimes use their trunks to protect the hunters.



One after another the legs of a captured elephant are fastened to stout trees. The creature grows furious, but, after wasting his energy in pulling and trumpeting, becomes exhausted, and gives in. Then he is treated to luscious food, and gradually becomes tamer, until at last he can be untied. Here the elephant seen in the upper picture has given up the struggle, and lain down. When a wild elephant will not lift up a leg so that he can be tied, the hunters tickle his foot with a leaf, and he at once raises it and the rope is slipped under it.

Therefore, recognizing that they are secure from injury, they become very bold, and are a real nuisance. Out in the wilds they have great battles, and fight in the natives' gardens, doing grievous damage to the poor people's crops. One wily native decided to punish the ring-leader of a swarm of monkeys which had injured him in this way.

He made a hole in the ground, and in it he placed a nice ripe banana. He concealed round the mouth of the hole the noose of a rope, which he hid in the sand. This rope ran through an iron ring which was attached to the trunk of a tree near by; and the end of the rope the native himself held as he hid and waited. Up came the monkeys, the bold old male leader coming out into the open, while all his wives and children remained for the time being hiding in the bushes. Ambling up he caught sight of the banana lying in the hole and grabbed at it. The native pulled the rope, and the noose closed round the arm of the monkey.

A good pull at the rope drew the monkey up to the tree where the iron ring was fastened. Then the native came out, and, walking round and round the tree, wound the rope round the monkey till he was securely fastened. The man then got a pot of soap and a brush, lathered the monkey, and shaved him. Then he released the monkey, who returned to his companions. They gazed upon him with amazement and disgust, fell on him and beat him, and drove him away. Their band broke up, and the man and his crops were left in peace.

#### A WILY NATIVE TRAP FOR FIERCE BABOONS

Baboon-trapping is exciting. It is easy to catch the animals, but the danger comes when they have to be handled, for their bite is terrible, and their strength is almost beyond belief. The hunters block up all the drinking-places but one. Near this they construct a trap like a hut, with a spring door. This is left open for some time, and grain is scattered in and about the trap, till the animals look upon it as a sort of refreshment-room. Then one day, when many are inside, a hunter pulls the trigger, the door shuts down, and the baboons are prisoners.

But no man dares go in to secure them. So pronged sticks are thrust through the sides of the trap, and by this means the

baboons are fixed, one by one, without hurt, to the walls of the hut, while their legs are secured. After they are thus tied, they are muzzled, and wrapped from head to foot in canvas, till they look like mummies. Very soon this treatment tames them, and they are placed in cages.

#### ELEPHANT-CATCHING: ITS EXCITEMENT AND DANGERS

Elephant-catching is exciting and interesting. These great animals are so much used for work in India that it is necessary to make frequent hunts for their capture, because elephants are rarely born in captivity. There are four ways in which these hunts are carried out. There is the hidden pitfall, into which the poor creatures tumble, often injuring themselves badly. Another way is for brave natives to steal up to a wild elephant as the herd is running away, and to cast a noose round its leg. Then the rope is twisted round the trunk of a tree, so securing the runaway. A third plan is to pursue a herd, the hunter riding on an elephant, and casting a noose over any one that he can catch. Thus, however, is not satisfactory, for by this means only the slowest, and therefore not the best, animals are caught, and there is great risk of injury, not only to the fleeing elephant, but to that which is pursuing, as well as to its rider. The best-known way of capturing elephants is to surround a herd and take them all.

When food is scarce, a large herd of elephants will break up into several small groups, the several parties keeping a few miles apart from each other and coming together again when rains have made food plentiful. The hunters go out three months in advance of the time fixed for the actual attempt at capture.

The party of men numbers two or three hundred. Their work is to find out the groups of elephants, and gradually to drive them all together. The men make, as it were, a ring round that part of the country over which the scattered herds are distributed. All work toward one centre and to this the elephants are gradually driven. Generally the wild elephant will seek safety in flight rather than attack a man.

While the hunters are slowly working the elephants up to a certain point, other men are busy preparing a great enclosure. A space of ground is fenced round with

a giant stockade, each piece of timber being the trunk of a strong tree. There is only one way into this—a narrow, funnel-shaped opening, which is closed once the herd has entered. At last, on the day fixed, the whole herd—males, females, and little ones—is driven toward this entrance. So far the task of the hunters has only been to keep the elephants together day and night.

By day they fire their guns to keep them within certain bounds; at night they light large fires to keep them from breaking out of the ring. Now that the animals are at last in the fatal enclosure, the time has come for the *mahouts*, as the elephant-keepers are called, to show their skill. But no matter how skilful they are, they could do very little were it not for the help given by tame elephants, as will be seen in the following account of a capture.

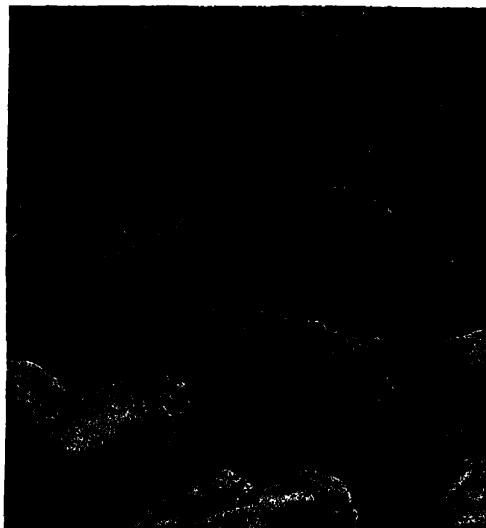
A herd of wild elephants had been driven into a safe enclosure, and two tame elephants, bearing their riders, entered. One had been doing good service in captivity for over a hundred years. The other elephant, named Siribeddi, was about fifty years of age. She entered the enclosure with a noiseless step, carrying two men on her back, and sauntered along with a simple air toward where the trapped elephants were. Every now and then she stopped to pluck a tuft of grass or a few leaves, as though she were engaged in the most ordinary work. The older elephant jogged innocently along behind. As the two tame elephants drew near, the wild ones advanced to meet them, and their leader put his trunk in a friendly way over the head of Siribeddi.

Siribeddi crept after him, and gave the man with the noose a chance to slip down and put it over the other elephant's foot. He saw the danger, and shook off the rope; then he turned to

make a furious attack upon the man, who would have been killed had not Siribeddi driven back the attacking elephant.

The herd again formed a circle, and the two tame elephants pushed their way into the middle of the group, one on each side of the largest male, so that the three stood abreast. The male made no resistance, but showed his uneasiness by shifting from foot to foot. The man with the noose now crept up, and, waiting until the elephant lifted a hind foot, drew the rope tightly round it. The other end of the rope was fastened to Siribeddi's collar. When the noose had been fixed, Siribeddi instantly drew back, dragging the elephant with her. The old elephant followed.

The wild elephant had to be drawn backwards for fully thirty yards, struggling and plunging all the way. But Siribeddi knew her business. She walked round and round a tree, winding the rope round it, all the time holding it tight. With all her strength she could not draw the elephant close up to the tree, so the old elephant now ap-



A HERD OF CAPTURED WILD ELEPHANTS

Photograph copyright by Underwood & Underwood

proached, and facing him, head to head and shoulder to shoulder, forced him backwards. At every step Siribeddi drew in the slackened rope, and finally brought the wild elephant to the very foot of the tree. Then the man tied the second hind leg to the tree, after which the tame elephants placed themselves on each side of him, so the man could creep down and draw a rope round his fore feet, and he was a prisoner.

The largest and strongest female elephant is generally the leader of the herd, and there is often a strong family resemblance between members of the same herd. In India even the elephants are known as "high-caste" or "low-caste" according to their distinctive marks.

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## A GREAT PIONEER



Daniel Boone is here represented on a hunting expedition in his old age. Up to the end of his long life he made long hunting trips, sometimes with only one companion, and it is said that on one of these trips he traveled across the continent, and that he saw the wonders of the region that is now Yellowstone Park.

# The Book of MEN & WOMEN



A Pioneer's Log Cabin in the Backwoods.

## TWO AMERICAN PIONEERS

THE pioneers of an army are the men who, armed with spades and axes, go before the main body to prepare a camp, dig trenches, or bridge rivers. So we can easily see how the word came to be used as a name for men who strike out on a new path, making a way for others to follow. When we speak of "The Pioneers" in the history of North America, we mean particularly those men who left the older settlements and struck out into the forest, across rivers and mountains, plains and deserts, to make new homes in the wilderness. They were brave, hardy men, filled with great courage. Sometimes they left the older settlements to make room for other members of their families. Sometimes on a hunting expedition, they wandered into a more than usually fertile or beautiful spot, of which they made haste to tell their friends. A few of them, like Cooper's "Pathfinder," grew to love the quiet and loneliness of the woods. The sound of the wind in the trees and the song of the river were more to them than the voices of men, and they fled at the approach of civilization. Some of them were men to whom any kind of settled life was hateful. Others set out in search of

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gold, like the miners of California, or, nearer our own time, of Alaska and the northern part of British Columbia. Where they went others followed, and we owe it to the pioneers that the vast prairies of the West, over which the buffalo roamed, have become a granary for millions, and the busy hum of cities is heard where once the howl of the wolf broke the silence.

### THE BEST KNOWN OF AMERICAN PIONEERS

Many of the picturesque band of early pioneers are to us nameless. Others had names which will be handed down through history, and perhaps the best known of all, not so much for what he did, as for what he was, is Daniel Boone.

Throughout Daniel Boone's long life, the frontier was his home, and from his early childhood to his old age his days were full of adventure. It is strange to us now to think of the Schuylkill Valley as being on the frontier, but when he was born there, in 1734, not fifty years before the Declaration of Independence, it was just on the edge of civilization. He was born in a log cabin, and until late in his life he did not know what it was to live in a less primitive dwelling.



It is always interesting to know something about the family of a noted man. We like to ask about his people, where they came from and what they were like, and fortunately in the case of Daniel Boone we can answer all these questions. Some years before the time that our story begins, a Devonshire weaver came to settle in the Quaker colony of Pennsylvania, bringing with him his wife and a large family of boys and girls, whose influence for good in the country has been great and far-reaching. Squire Boone, one of these boys, married Sarah Morgan, a Welsh Quakeress, and Daniel Boone was one of their sons. Both his father and mother were brave and good, and taught their children the self-dependence, self-control, large patience and loyalty for which Daniel was noted.

#### LIFE ON THE FRONTIER

There were few schools in the country in those days, and none within his reach, and it was not until he was fourteen that he got a chance to learn to read and write. Then his brother's marriage gave the boy a sister-in-law who gladly taught him all she knew,—reading, writing, and a little arithmetic. But though he was able to gain little knowledge from books, he learned many things from nature. He knew well the trees and plants in the forest, and was familiar with the haunts and habits of the wild things that made the woods their home.

About five or six miles away from his clearing, Daniel's father owned some good pasture land, to which the cows were sent to graze each summer. There the boy's mother took him every year from the time that he was ten years old, and there they stayed until the cold weather forced them to go home again. His task was not an easy one. He had to keep the cattle from straying away into the deep forest through the day, and in the evening drive them back to the log enclosure round the cabin, where he helped his mother to fasten them up for the night, safe from wild beasts and thieving Indians.

#### THE INDIANS IN PENNSYLVANIA

For themselves they had no fear of the Indians, who were always friendly to the Pennsylvanians. From his earliest infancy Daniel was familiar with the silent Red Men, who came perhaps to trade their

furs for the cloth and blankets that his father wove, or stood to watch the sparks that flew from the anvil in his blacksmith's shop. Or perhaps two or three of them would come on a cold winter's night to ask for shelter from the storm, and wrapping themselves in their deer-skins, would lie down to sleep on the cabin floor, with their feet to the log burning on the low hearth. He soon learned to imitate them, as they glided through the forest, and it was in these early days that he gained the knowledge of their ways, which helped him out of many a difficulty in the Indian warfare in which all the settlers were forced to take a part.

In spite of hard work, he had plenty of time for play, and it was during his summer days in the woods that he laid the foundation for his fame as a hunter. At first, his only weapon was a sapling torn up by the roots and trimmed down until it was just such a weapon as the staff which David used to kill the lion and the bear. His father was very proud of his skill in bringing down game by flinging this light club, and when he was twelve years old gave him a rifle of his own. With this he soon became an unerring marksman, and henceforth kept the family larder well supplied with food, for the forests around his home swarmed with game.

#### THE BOONE FAMILY MOVES TO NORTH CAROLINA

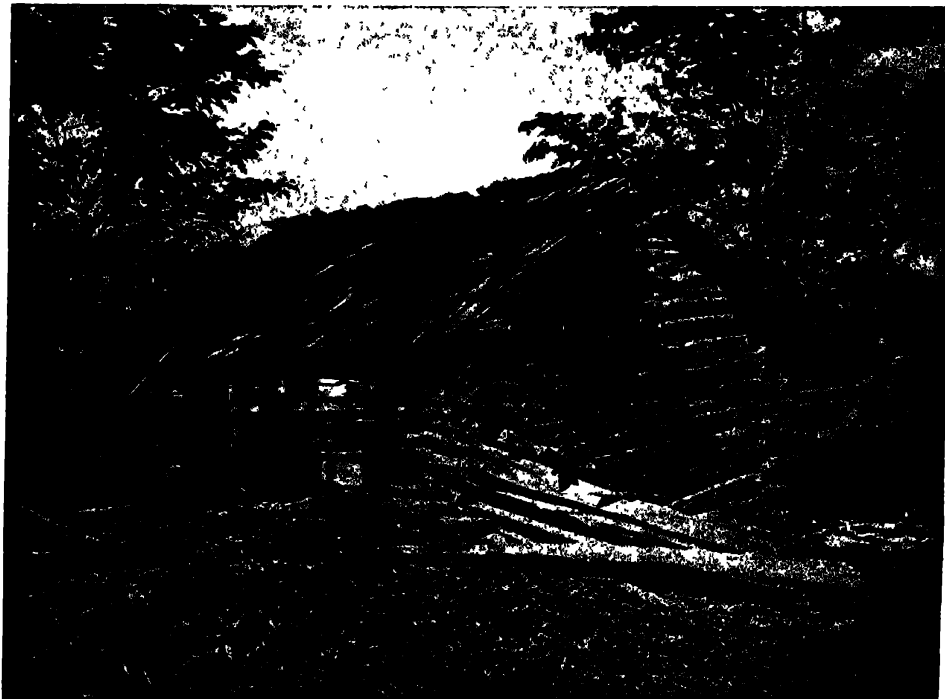
When he was about sixteen, the family left Pennsylvania, and traveled down through the Shenandoah Valley into North Carolina. It was a long journey for a large family to take with their horses, cattle, implements and household goods, but they traveled slowly, and Daniel had plenty of time to go on long hunts and explore the country through which they passed. They took two years on the way, but at length they reached their destination, and settled down at Blue Lick in the Yadkin Valley.

These "Licks," of which we read so much, were very interesting places. In many parts of our country, and especially in Kentucky, there are a number of salt springs, and from time immemorial these springs were haunted by wild animals, who came to lick the salt left by the water as it flowed away. They kept the ground around the spring licked bare, and so the place was called a "lick."

## EARLY DAYS IN KENTUCKY



This rather crude picture is taken from an old drawing, representing Daniel Boone and his friends rescuing his daughter and two companions from a party of Indians who had captured them. The three girls were on the Kentucky River, near the Fort at Boonesborough, when their canoes were carried to the other side by the current, and the Indians, who were hiding in the bushes, caught them and carried them off.



This picture shows the ruins of Daniel Boone's cabin at Femme Osage, in what is now the state of Missouri. When Boone left the western part of Virginia, in 1799, to find a place where he would have "elbow room," as he called it, he crossed over into Louisiana, which had been transferred by France to Spain, at the end of the French and Indian War. It became part of the United States by the Louisiana Purchase.

# **YOUNG BOONE GOES TO FIGHT AGAINST THE INDIANS**

For the next three years Daniel lived at home, helping his father and brothers in the blacksmith shop in the winter, and in the summer going off on long hunting trips. But when he was twenty-one, war broke out with the French and Indians, and his hunting ended until it was over. The war, which is called the French and Indian, or the Seven Years' War, had been brewing for some time. A struggle was going on between the French and British for possession of the country west of the mountains. The warlike northern tribes of Indians were friendly to the French, and encouraged by them began to make raids on the Indians who were friendly to the British. Soon they became bolder, and began to attack the settlements which had been made in the valleys between the mountain chains. Then the French built forts in territory which was claimed by Virginia, and under their leadership the hostile Indians became very daring.

In 1756 General Braddock with a small army was sent from England to drive back the intruding Frenchmen, and teach their Indian allies a lesson. The expedition ended badly. General Braddock knew nothing about Indian warfare, but would not listen to the advice of the frontiersmen who were with him, because he thought they knew nothing about the profession of arms. In consequence, he fell into an ambush, and although he and his men fought bravely, they were defeated, and he himself was killed. Daniel Boone was with the army, and was in the thick of the fight.

## **BOONE BEGINS TO EXPLORE THE WILDERNESS**

He was married shortly after this to Rebecca Bryan, the daughter of one of their nearest neighbors, and settled down to a life of hunting, trapping, blacksmithing and farming. But though he lived for many years in the little log house that he built, his days were not peaceful. Once the Indian wars had begun, they did not cease until after Canada was taken from the French in 1763, and at one time there was so much danger that Daniel thought it best to take his wife and little ones out to Virginia for a while.

But he soon came back, and took his full share in the fighting. We know that

he was present at some of the battles, and once he went away down into Tennessee,—it is thought on a scouting expedition. Up to a few years ago, a tree stood on the banks of Boone Creek, in Tennessee, on which was cut an inscription reading:

D. Boone  
called a BAR  
on this tree  
year  
1760.

After peace came he devoted more and more of his time to hunting, and in fact made it his principal occupation. Very soon he began to think of changing his abode, for there were now a great many families living in the valley, and it is said that he liked his nearest neighbors to be so far away that he could not see their chimney smoke as it curled in the breeze.

In 1765, he set out on horseback, with seven other men, to find his way to Florida, which was then a new colony. They had a terrible journey down through the swamps, and once nearly died of hunger, for the hunting was very poor, and food hard to get. However, he reached Pensacola, and might have gone to live there, if his wife, when he told her of the trip, had not decided against it. She knew that he would be unhappy unless he had plenty of his beloved hunting.

## **THE "DARK AND BLOODY GROUND" CALLED KENTUCKY**

Then he turned his thoughts westward to the land beyond the mountains,—Kentucky, the "dark and bloody ground" of the Indians, of which he had heard many wonderful tales.

He made an attempt to find it in 1767, and, with one companion, actually spent the winter there without knowing that he had reached it, but it was not until 1769 that he set out on the expedition that made him one of the founders of the state. It was his report, based on observations made on this second trip, which induced Colonel Henderson to organize the famous Transylvania Company.

This time, he and his companions penetrated into the country. They climbed up over the Blue Ridge Mountains, the Stone and Iron Mountains, through Moccasin Gap of Clinch Mountain, through Powell's Valley, up a hunter's trail through Cumberland Gap until they

struck the "Warrior's Path," beaten by the feet of generations of Indian war parties, and so down into the forests of Kentucky.

### ALONE IN THE WOODS

Daniel did not leave Kentucky, the land of his dreams, for two years, and twice was left alone for months, without even a dog as companion. But during these lonely months he was not idle. He wandered all over the country, exploring it in every direction, noting its beauties, its well-watered plains and valleys, and storing up in his active mind knowledge that was of great value to the settlers who followed him into this fertile region. His brother Squire, who had been his companion during the year, came back in December, and they spent another winter in the woods. But this time they fell in with another party of hunters who met them in a curious way. One evening when these men were making camp, they heard what, in that place, was a most extraordinary noise. Motioning his companions to be silent, the leader crept cautiously forward and presently came on Daniel Boone, lying flat on his back and happily singing at the top of his voice as he waited for his brother.

Boone was delighted with the Kentucky country, and in 1773 persuaded a number of families to join in attempting to make a settlement there. But one night, when they were on the way, his eldest son and some companions were surprised and killed by Indians, and overcome with sorrow and fright, the little party decided not to go on. Boone and his family stayed for a time in Western Virginia, and the others went back to their old homes.

### BOONE IN "LORD DUNMORE'S WAR"

A new war now broke out with the Indians, who had been greatly angered by the treatment they had received from the white men. Boone did good service in this war, which is known in history as "Lord Dunmore's War," and received great praise for his work. During this war he was sent to warn some scattered parties of their danger, and traveled eight hundred miles in sixty days through woods which were alive with Indians.

The Indians were soon subdued, and when peace came the settlement of Kentucky was seriously begun. The new ef-

fort was made, on a much larger scale than before, by the Transylvania Company, with Colonel Richard Henderson at its head, and Daniel Boone for one of the leaders. Early in 1775 the first party of settlers reached Big Lick on the Kentucky, by the path which has since been marked out by the Daughters of the Revolution. They at once began to build a fort, and Boone turned surveyor, laid out the site of a town, to be called Boonesborough, and planned the fort. Outside this fort there was a great elm tree, and under its shade the first assembly ever held in Kentucky met to make laws to govern the little community.

### THE GROWTH OF KENTUCKY HINDERED BY WAR

In spite of various drawbacks, the little colony grew steadily. Boone and a number of the other settlers brought their wives and families, and prosperity seemed in sight. But the War of the Revolution broke out and the Indians who were allied to the British commenced to raid the weak settlements. The first warning that the Boonesborough settlers had of their peril was the kidnaping of Boone's daughter Jemima and her two friends, Betsey and Fanny Calloway. The three girls were paddling on the Kentucky one Sunday afternoon when their canoe was carried by the current to the opposite bank, and they were captured by five Indians who had been watching the fort from the bushes. Colonel Calloway, the father of Betsey and Fanny, followed in hot pursuit with a party of mounted men. Boone, leading a party on foot, followed the trail and, guided by the scraps of clothing and bruised twigs which the brave girls contrived to leave in the path, caught up with them and rescued them.

### BOONE TAKEN CAPTIVE BY INDIANS

The war times were gloomy days for Kentucky. Provisions were scarce, and game was hard to get, for there was always danger of surprise from the Indians. Boone's fort was often attacked, and once he was wounded and barely escaped with his life. Another time, when he had gone into camp at Blue Lick to make salt, he was captured by a war party of Indians who were on their way to attack Boonesborough. He knew that the fort was not ready for defence, and in desperation promised the Indians that if they would put off the attack until spring,

he would persuade his companions to surrender to them. The Indians made the promise, thinking that he would lead them in the spring, when they could comfortably and safely carry off the whole community. The other members of his party listened to his persuasions, and these brave men, to save their families and friends, voluntarily went into what they knew would be a hard and bitter captivity. All through the winter they were dragged about the country from place to place, going even as far as Detroit.

In the spring, when the Indians were gathering for the attack on the settlements, Boone managed to escape and, without food, traveled steadily on towards the fort. He reached it in four days, walking forty miles a day, having eaten only one meal during the whole journey.

#### THE FAMOUS SIEGE OF BOONESBOROUGH

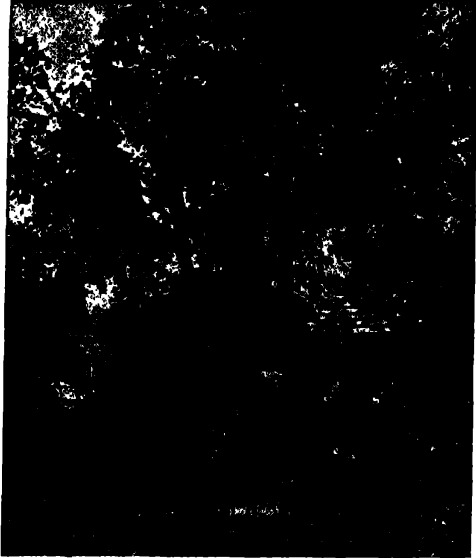
The fort was quite unprepared for an attack, but he set the people vigorously to work, and soon had everything in readiness. However, the Indians did not reach the fort until September, when they appeared in large force, and the siege of Boonesborough, which lasted for ten days, is famous in the annals of Kentucky. At times the settlers almost despaired; but at last, to their joy, the noise of shouting and fighting suddenly quieted down, and the Indians silently disappeared in the forest.

For years the settlers in Kentucky endured hardships and suffered many things from the Indians, who continued to harass the settlements even after the War of Independence came to an end, and they were no longer supported by the British. In spite of sorrow and hardships, however, the country continued to fill up, and Boone was in great demand as a surveyor. His knowledge of the Indians and his calm bravery and patience made him a tower of strength. He was made lieutenant of his county, town trustee, and was sent as representative to the legislature at Richmond.

#### BOONE LOSES HIS LAND THROUGH CARELESSNESS

He does not appear to have been a good business man, and in spite of the fact that he was a surveyor and must have known the regulations, he failed to file his own land claims. As a consequence, new set-

tlers registered claims against the property which he had marked for his own, and then brought suit against him to obtain possession of them. As he had failed to comply with the law, the courts could



After Daniel Boone moved over into that part of Louisiana, which is now the state of Missouri, the Spanish governor made him syndic, or magistrate. While he held office, he held his court under this tree, which is now called the "Judgment Tree."

do nothing for him, and he found himself without an acre of ground in his beloved Kentucky. Sadly disappointed, he left it and went back to Western Virginia, where he lived at the little village of Point Pleasant in the Kanawha Valley for a number of years. He was held in great esteem by the people of Virginia, who again sent him to the Assembly at Richmond, though he cannot be said to have been a brilliant success as a legislator.

After the final defeat of the Indians by General Anthony Wayne, more people began to arrive in Kanawha Valley, and again Boone felt that he must move so that he might have "elbow room" as he expressed it. Some members of his family had gone down in 1799 to Missouri—then under Spanish rule—and there he followed them in the following spring with his wife and family and all his possessions. They went by water, and we can imagine the picturesque little procession as it followed the shores of Kentucky down the broad Ohio.

He was very happy for a few years in Missouri. He received a large tract of

land from the government, had plenty of room, good hunting, and was made magistrate of his district, an office in which he was very popular.

# **BOONE AGAIN HAS TROUBLE ABOUT LAND TITLES**

But after what is known as the Louisiana Purchase, Missouri came under the government of the United States, and again we have a repetition of the old

his life was tenderly cared for by his sons, to whom he had sold his land, so that he might pay some debts which he owed in Kentucky. He lived until 1820, always happy and active, going off sometimes on a hunting trip, sometimes working a little on the farm.

At the time of his death, there was in session, in St. Louis, a convention to draft a constitution for the state of Missouri,



A PIONEER HOME

This is the kind of home which the pioneers built on the edge of the wilderness. The men have felled trees, in clearing the ground for cultivation, and are dragging them into a heap to burn them. During his adventurous life, Boone must have assisted many times at such a scene as this.

story. Where the pioneers had gone, others followed, the land was broken up for cultivation, the Indians moved away, and the wild animals were killed off, or fled before civilization.

Under the new laws, Boone lost his office, and for some time had a good deal of trouble about his lands, because he had again neglected to see that his title was registered. However, this difficulty was settled happily by the government making a special grant to him of a thousand acres. He did not move again, for he was now an old man, but contented himself with making long hunting trips, and once, it is said, went as far as the region of Yellowstone Park.

In 1813, he was greatly saddened by the loss of his wife, and after her death left the little house in which they had lived for years, and for the remainder of

which had applied for admission to the Union. Upon hearing the news of his death, the delegates to the convention adjourned for the day as a token of the respect in which he was held, and each member wore a band of crape on his left arm as a sign of mourning.

# **KENTUCKY ERECTS A MONUMENT TO BOONE**

Some years after his death, the people of Kentucky felt that some honor should be shown to Boone, and a monument was built to his memory at Frankfort, the capital city. He was not the first man to explore the region, nor even the first to settle in it, but they realized that he was the best type of pioneer, and that in honoring him they honored what was greatest in the men who had taken their lives in their hands and gone out into the wilderness to build a nation.

## JAMES ROBERTSON OF TENNESSEE

WHILE Daniel Boone was helping to build the state of Kentucky, the same work was being done in Tennessee by James Robertson. Robertson, who was a few years younger than Boone, was born in Virginia. We know little of his early years, except that while he was only a child, his family moved to North Carolina. Of course, he learned to hunt and shoot, and knew all the trees and plants, and the birds and animals of the woods, how they lived, and where they made their homes. Every boy of pioneer days learned these things, or was counted of not much use to his community. But he never went to school, for it is probable that he was out of reach of one, and his father was poor. When he was about twenty-six, Robertson married, and his young wife took time, from all the other tasks that fell to the lot of a pioneer's wife, to teach him how to read and write.

When he had been married about two years, Robertson decided to go in search of a place where he could make a new settlement. With nothing but his horse and his rifle for company, he crossed the mountains and found himself in the lovely Watauga Valley, where there were already a few settlers as adventurous as himself. He stayed long enough to prove the fertility of the land by growing a field of corn, and then recrossed the mountains to bring his family back to build the new home that he planned.

On the long journey back through the mountains he lost his way and his horse, and if he had not been rescued by hunters, he would have lost his life; but he reached home safely, and so full of enthusiasm that sixteen other families determined to join him when he set out in the spring.

### A LONG JOURNEY TO A NEW HOME

Many of us know the discomforts of moving even from one comfortable house to another, though with the aid of skilled packers, who take every care of our treasured belongings. But can you imagine the moving of those seventeen families who set out to make the Watauga settlement? Early in the spring, everything that could be carried on the backs of horses was packed, the things that could not be taken were sold or given to neighbors, the door of the old home was closed, and each family set out for the meeting

place. There the sadness felt at leaving the old home was forgotten in the feeling of adventure. With the leader at the head of the column, the women and children on horseback, the men trudging at the horses' heads and keeping vigilant watch, and the boys ranging the forest on either side, or driving the cattle that they brought with them, the little party went forward with high hopes. At night they camped, and you can imagine the delicious feeling of safe fear with which a little boy went to sleep under the starlight, in his father's strong arms, or a little girl nestled close beside her mother, near the fire, sure that any prowling Indians or bears or wolves would fall before the unerring aim of the men on watch.

They arrived safely at the Watauga and the men soon built the log cabins that were to be their homes, and gradually made the simple furniture that had to fill their needs in the early years of the settlement. Trees were cut down to clear the fields, and the land was tilled. The next year John Sevier, also a native of Virginia, joined the settlement, and he and Robertson became the leaders of the little community.

### THE LITTLE SETTLEMENT FORMS A GOVERNMENT

The Watauga Valley, in which the new settlement was made, was far from the older settlements and the towns where the courts of law were held. So the men met in convention and decided to form a government of their own. They drew up a written constitution known as the "Articles of the Watauga Association" and elected a little assembly of thirteen representatives to govern them. From among the representatives five were chosen, and these men formed a court to try all cases of wrong-doing.

That same year Robertson and another man made a treaty with the Cherokee Indians who lived near by. To celebrate the treaty, sports were held, to which the Indians were invited, and a feast was made. But some bad men who were prowling around in the woods killed an Indian, and the whole party left the settlement vowing vengeance upon it. Not a moment was to be lost. Leaving Sevier and the other men to build a strong fort as a place of refuge, Robertson set out alone to make peace with the Indians.

Although he knew that they might torture him to death, he followed them through the forest, and when he came up with them apologized for the action of the wrong-doer and won them over completely by his fearlessness and courtesy.

#### **A** NOTHER MOVE THROUGH THE LONELY WILDERNESS

Robertson prospered in Watauga, but about eight years after he settled there, he determined to go further afield. This time he made up his mind that before the moving began there should be some houses for the people to move into. So, in the spring, he and eight other men climbed the Cumberland Mountains and went down the other side into the land that lies between the Cumberland and the Tennessee. They traveled as far as French Lick, which they decided was a good place for a settlement, and there they planted a large field of corn and built log cabins. When the work was done, three men stayed to guard the crop and the houses, and the others went back to Watauga to show the way to the men and women who were to make the new settlement.

Most of the younger men of Robertson's party followed him through the mountains to the Cumberland Valley. It was a toilsome road, however. It was thought that the river would be an easier way for the women and children to take, and with a few men, they went round by boat. Look at your map, and you can easily follow the adventurous voyage taken in the winter of 1780 by so many boys and girls, some of them perhaps the ancestors of some of our readers. The party, we are told, left Cloud Creek, on February 27, 1780, under command of John Donelson, a friend of Robertson. They floated down the Tennessee until they reached the Ohio, rowed and paddled up the Ohio to the Cumberland, and up the Cumberland to Big Salt Lick, where Robertson met them. Two months had been spent on the way and much of the time they had been in peril from Indians, and toward the end, they were sometimes hungry.

No sooner were the people settled down in fixed habitations than Robertson and Colonel Richard Henderson, who had been associated with Boone, helped to organize a government. Representatives were chosen by each of the little villages in the settlement, and the representatives

met in Nashborough, the central fort, which was built where Nashville now stands. Robertson was made chairman of the court, and colonel of the militia, and seems to have been looked upon as the natural leader of the whole community. He was one of those men who seem born to lead others, not because of birth or education, but because of bravery, good judgment, and high character.

#### **H**ARD DAYS OF INDIAN WARFARE ON THE FRONTIER

Before long the Indians attacked the new settlement and the settlers were kept constantly on the alert. Some families deserted their clearings and went back to their old homes. Others wanted to go but Robertson persuaded them that to face the dangers was the braver part, and heartened by his strength, they stayed and were able to fight off their attackers. As winter came on the powder and bullets began to run short, and the dauntless Robertson went alone through the woods to Kentucky, where he got a supply, and brought it back just in time to beat off two attacks made by the Indians.

Robertson suffered much hardship during the years of Indian warfare which came after the Revolution. One of his sons was killed, and he, himself, was wounded and almost captured. But the great-hearted man was a tower of strength to the people of the Cumberland region. We find him promising that a road should be built and seeing that it should be done, organizing armed forces and leading an expedition against the Indians, and persuading new settlers to come into the district, for he knew that the only way to quiet the Indians was to overawe them by filling the country with white people. Many strong men and women did come in. By degrees the country filled up with comfortable farms, and except on the border, the warfare died out.

All this time the country which is now Tennessee had been part of North Carolina. In 1791, however, North Carolina ceded it to the nation, and it was made the Territory of Tennessee. Robertson was put in command of the militia in the western part of the territory, and a few years after the State of Tennessee was admitted to the Union he was made a state senator. He died in 1814 at the age of sixty-eight, and his memory is honored to the present day.

THE NEXT STORY OF MEN AND WOMEN IS ON PAGE 6349.

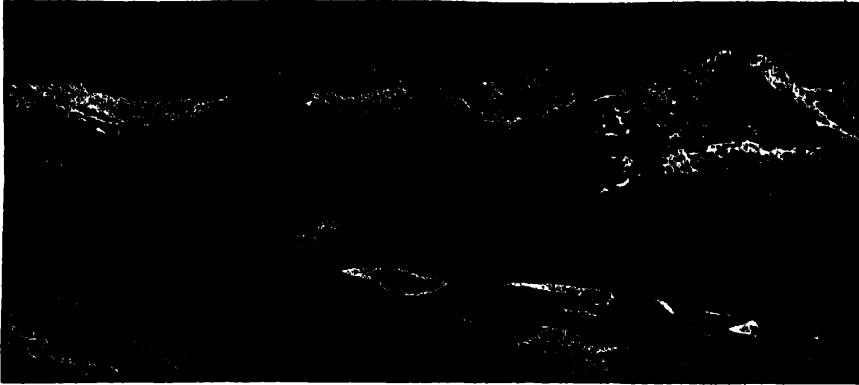


## THE MIGHTY HEIGHTS ABOVE THE TRAIN



### AN IMAGINARY VIEW OF THE TRAIN RUNNING THROUGH TUNNEL UNDER THE ALPS

More than a mile below the tops of the mighty mountains rushes the brilliantly lighted train, with its load of perhaps five hundred passengers. The artist here shows us an imaginary section under the Alps, with children above, all unconscious of the fact that, could they but see through the solid rock, the train would appear below, like a fiery serpent boring its way through the black mass beneath them.



The greatest mass of mountains in Europe, through parts of which the Simplon Tunnel runs.

## BORING THROUGH THE ALPS THE MOST WONDERFUL WAY EVER MADE

THE story of the boring of the famous tunnels through the Alps is like a fairy tale. There are three of these tunnels—the St. Gothard, the Mont Cenis, and the Simplon—and through them, every day, hundreds of travelers pass out of Switzerland into Italy, beneath the Alps, in the very heart of the greatest mountains in Europe, with millions of tons of earth stretching for more than a mile between them and the sky.

Let us take one of these tunnels only—the Simplon. The work occupied 10,000 men nearly eight years, and cost over fifteen million dollars. When Hannibal crossed the Alps with his army, it took him fifteen days, and cost an enormous number of lives. Napoleon took five days to cross when he set out to conquer Italy. He did not forget the difficulties of the crossing, and when he became emperor he built the Simplon Road running along the Simplon Pass, over a shoulder of the mountain, and rising to a height of 6,600 feet. It is 42 miles long; it is carried over 611 bridges, through many galleries and short tunnels cut in the rock, or built of solid masonry to protect the traveler from the swift rush of avalanches in winter. Until

CONTINUED FROM 6214

the opening of the Simplon Tunnel, that was the only way over the Alps at this point.

The Alps are pierced by two other famous tunnels—the Mont Cenis and the St. Gothard—but they are far away from the Simplon.

There are two features in which the Simplon Tunnel differs from all others. Being  $12\frac{1}{2}$  miles in length, it is longer than any other railway tunnel in the world. A more remarkable point is the immense distance beneath the surface at which it runs. When we reach the highest point to which the tunnel climbs in the heart of the mountain, we have still more than a mile of solid rock above us. It could have been made much nearer the top of the mountain, but that would have meant a very high climb for the trains before reaching the tunnel. On the north, or Swiss, side the entrance is 2,249 feet above sea-level, while on the Italian side it is 2,079 feet. The tunnel slowly rises till it reaches a height of 2,310 feet. Above that lies a mass of mountain more than a mile high. At one point it is 7,005 feet below the surface. The tunnel slopes slightly towards each end, so that any water which enters may run down the slopes and escape. The tunnel is

double: that is, there are two parallel tunnels 56 feet apart, each carrying one line of railway. This plan greatly helped ventilation, and ensured the health of the men.

The engineers expected to find great heat—for the deeper we go in the earth the higher the temperature rises. They expected to find a heat of about 100 degrees, but when they came to the worst part they met a heat of 132 degrees, while hot water flowed in. There were rivers and lakes hidden in the mountains of which they had previously known nothing. There were soft parts, too, in the mountains, which they had not expected to find.

The two ends of the tunnel—Brigue on the Swiss side, and Iselle on the Italian—became cities of industry. The Rhone at the Swiss end and the Diveria at the Italian were harnessed and made to supply power for driving the many kinds of machinery which were used. A new colony sprang into existence at each end of the tunnel, in which were comfortable homes for the workmen and their families, cafés, hospitals, places of amusement.

Everywhere these little towns were lighted by electricity, made by the running of the harnessed rivers. The comfort of the workmen was looked after. They had special clothes to work in, warm and cold shower-baths, and cooling chambers were furnished, to prevent their feeling the cold on coming out from the hot depths of the mountain into the chill atmosphere of the Alps. Machinery forced in enormous quantities of cold, pure air, and drew out the foul air. Few horses were allowed in the tunnel, because they made the air impure; and special watering machinery instantly converted the dust into mud, so that the men should not breathe it. The conditions were excellent, and the men worked with extraordinary goodwill. When the St. Gothard tunnel was built the death-rate among the working force was 800 in eight years. During the seven years' work on the Simplon, only 60 deaths occurred.

Work was begun at both ends of the tunnel at once—with 6,000 men on the Italian side, where the harder work was expected, and 4,000 men on the Swiss side. Drills driven by hydraulic power were used to bore holes in the rock, and in the holes thus made charges of dynamite were placed and fired.

Water under heavy pressure smashed up the rock which the dynamite dislodged, and long trains carried away the rubbish and brought in building material, so that solid masonry could be built to form walls, and give extra support. Day and night men were at work, working in shifts of eight hours each. All the machinery for the work had to be specially made, and with this the men bored away 18 feet a day. The men on the Italian side worked toward the Swiss side, and those on the Swiss side toward the Italian.

For a time all went well. Soon, however, those on the Italian side met with unlooked-for difficulties. They broke into soft and treacherous ground, where they had expected to meet solid rock. To make this secure, they erected enormous timbers, but these were crushed. Next, heavy steel girders were tried, but so great was the pressure above and all round that these became twisted like wires. Not until quick-drying concrete was built round them could the girders be made to hold up.

Then the workmen came upon an underground river of intensely cold water. It rushed into the galleries at the rate of 10,564 gallons a minute. That gives nearly 100,000 tons of water in the course of the day and night, enough to supply all the wants of a large city. The coldness of the water reduced the temperature to 55 degrees, the lowest point recorded.

The men worked in waterproofs and rubber boots and leggings, but they were in a shower-bath the whole time, and up to their knees in water, and often in danger of drowning. Drainage systems had to be constructed to carry away this river, and, after a delay of six months, the danger-spot was safely passed.

Very soon afterwards, however, the rocks into which they were boring began to get hotter, and streams of hot water gushed out. Having passed a river of cold water, they had now come upon another, which filtered down through the scorching rocks. It flowed into the galleries at the rate of nearly 100,000 gallons an hour—a river of scalding water. Nobody on the spot dreamed of giving up the work, though everybody outside thought that the task must be abandoned. The men on the Swiss side

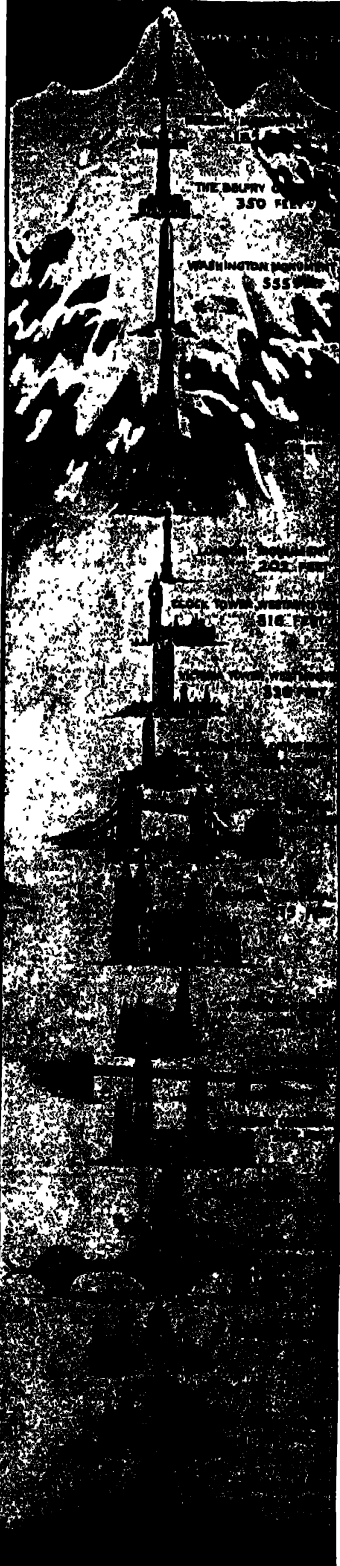
## BORING THROUGH THE ALPS

also had come upon baking rocks and hot water. The same idea was adopted for both sides of the tunnel. On the Swiss side powerful machinery pumped in cold water from beyond the end of the tunnel upon the burning rocks and upon the cracks from which the scalding water issued, and so cooled both rock and water. Cold water was also sprayed in the air.

The plan on the Swiss side worked well, until a great storm at that end of the tunnel caused a landslide, which cut off the water supply. The hot water was still pouring in, so the engineers had to put up enormously strong iron doors, right across the tunnel. This, to a great extent, shut out the flow of hot water, and enabled the men to go on building up the walls in the rest of the tunnel. And there they had to leave their boring, and wait for the men on the Italian side to work their way through.

The brave fellows on the Italian side worked doggedly on. They now turned one river against another. The cold river through which they had fought their way was made to serve the pumps, and to help to cool the scorching rocks and water where their present work lay.

Little by little they worked their way onwards to the spot where they expected to break through. They knew exactly the spot at which they *should* break through; and make the tunnel complete. They had been for years working



in what they hoped was a straight line. Had they gone straight, or had they gone astray, and might they have to go on boring, and find that they had missed the line that they should have followed?

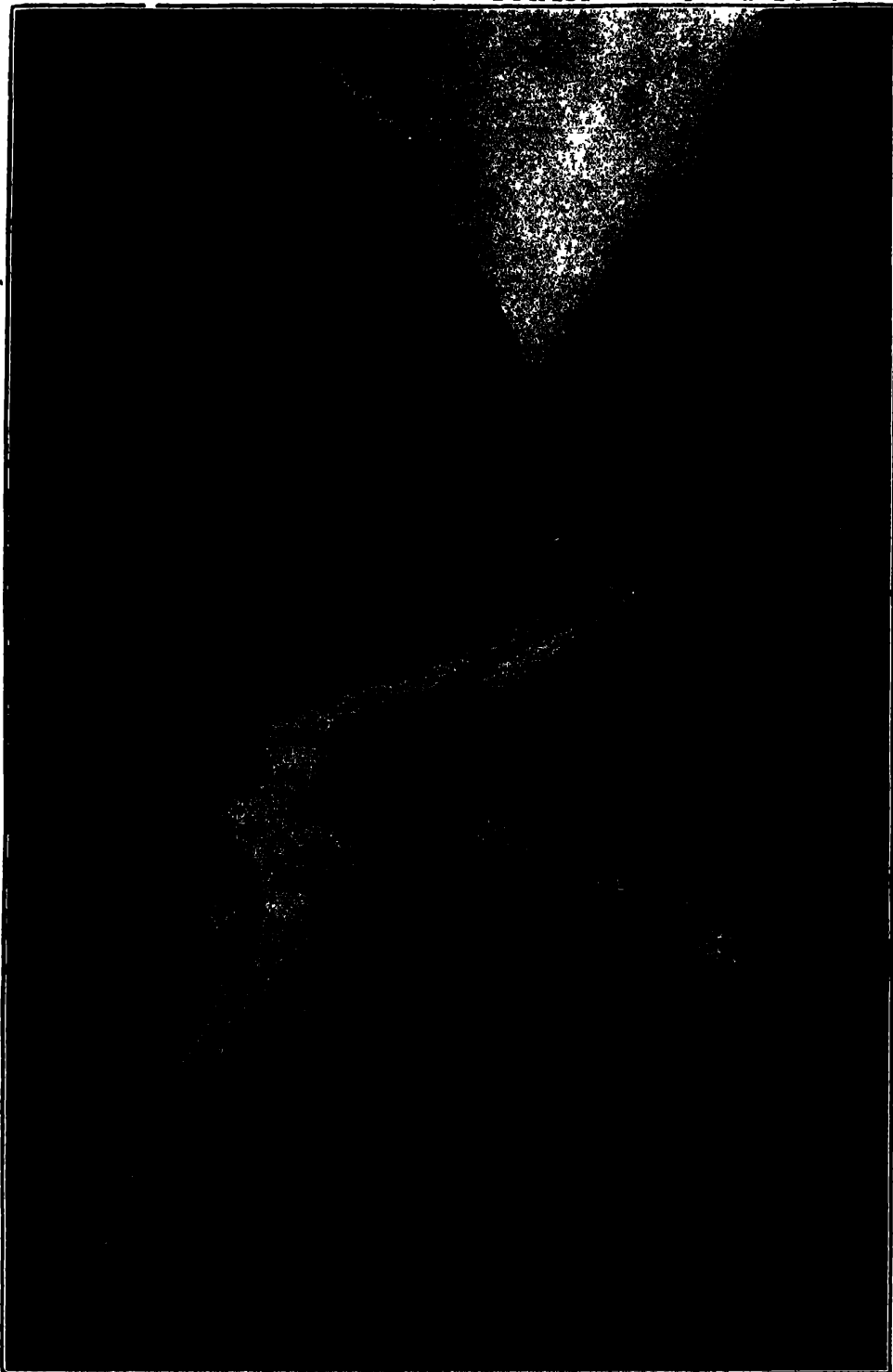
At last the men on the Swiss side heard the sound of the drills, and knew that the others were approaching them. Twenty feet, nineteen feet, then only sixteen feet remained, and so the last barrier was gradually bitten away by the drills. Then came the last charge of dynamite which was to open the way. It was put in and fired, and a hole in the rock eight feet wide opened. The tunnel was complete! After twelve miles of boring, starting from different countries, the workmen met in the heart of the Alps.

In May, 1906, the King of Italy and the President of Switzerland met in the tunnel, and a month later, nearly eight years from the beginning of the work, trains were running through the Simplon, the longest and deepest of all the tunnels in the world. The trains are drawn through by electric locomotives.

The route became so popular that a new or second Simplon tunnel was necessary. By 1915 the length of completed tunnel at the north and south ends was half done. The work was then seriously interfered with by the drafting of workmen for the Italian army, as so many great undertakings have been stopped by the greatest war in history.

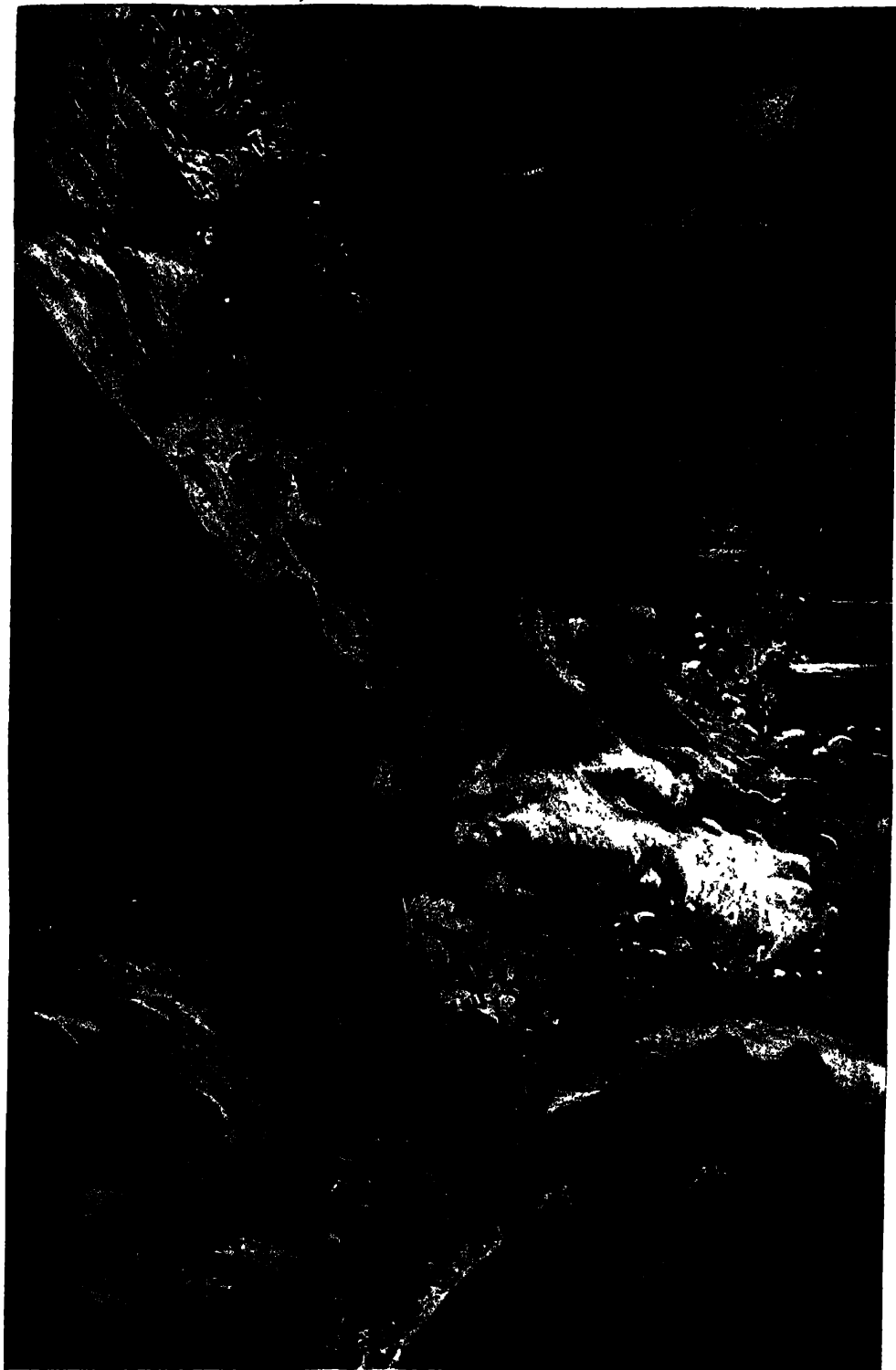
These 19 high buildings could stand like this between the mountain-top and the trains.

## WHERE THE UNSEEN TRAINS RUSH PAST



For thousands of years the famous Simplon Pass, shown in this picture, was the principal route across the Alps, but since 1906, when the Simplon Tunnel that had been bored through the solid mass of the mountains was opened, the pass has been very little used. The splendid road was built by Napoleon. Now, instead of plodding or driving across this road, travelers dash through the mountains unseen by the mountaineers.

## THE CRASH, CRASH OF AN AVALANCHE



This picture gives some idea of the scene of terror when an avalanche crashes down the mountain-side. A very small cause will set the mass of overloaded snow in motion. The Simplon tunnel was built not only in order to shorten the route but also to avoid the possibility of a railway being blocked by an avalanche.

## BLOWING UP A MOUNTAIN FROM INSIDE



The great tunnel was made by blowing a passage through the mountains with explosives. After drills had bored holes in the face of the rock, cartridges were inserted and a man set light to them, as shown.



In firing cartridges, a time-fuse was used—a match that would burn for a time before exploding a cartridge—in order that the workmen could get to a place of safety. Here we see the tunnel after an explosion.

## HIDDEN RIVERS OF HOT AND COLD WATER



After blowing away the rock, the men were often in danger of being drowned by rushing water from springs that had been let loose. Sometimes the water was very hot, like that shown in this picture.



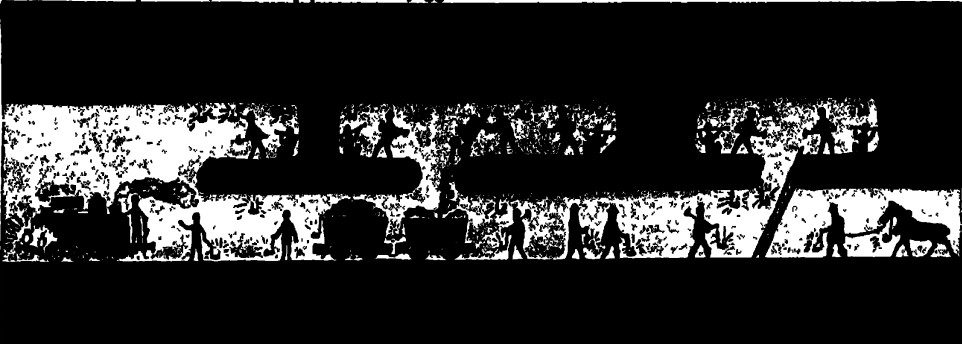
Many times the springs rushed in like a torrent, and here we see a cold spring that was tapped, pouring 25,000 gallons of water a minute into the workings. This caused a delay of six months in the work.



## THE LITTLE PIPES THAT PIERCED THE ALPS



It is really to these wonderful machines that we owe the tunnel. By means of a stream of water driven at tremendous pressure, a little pipe with a jagged end is turned round and round, eating away the rock.



For a great part of its length, two passages were excavated, as shown here, and then the dividing wall was removed. This plan made easier the ventilation of the tunnel and the removal of intruding water.



As the passage was made through the mountain, the rocky roof was held up by huge timbers, as shown on the left. Then steel frames with more timber were erected, as on right, and stone walls were built in.

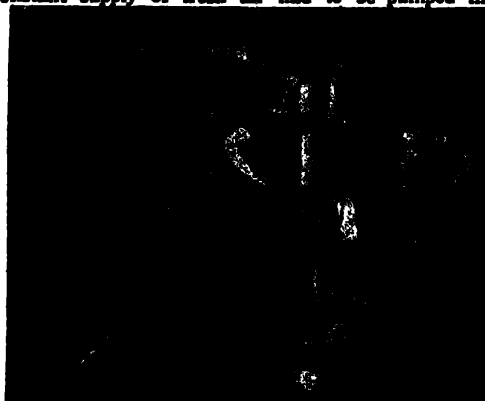
## WATER PUMPED OUT AND AIR PUMPED IN



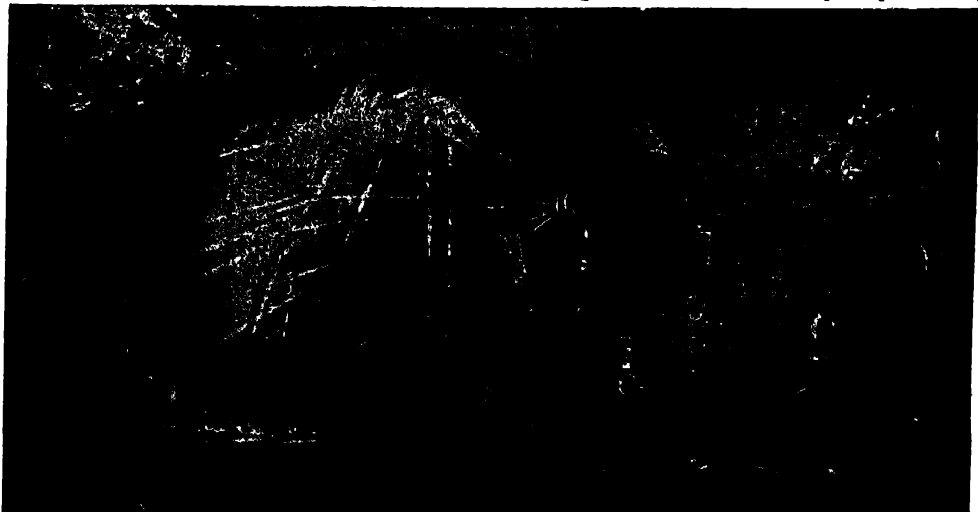
Tunneling was made possible by the work of huge pumps like the one shown here. Vast volumes of water that poured in had to be pumped out, and a constant supply of fresh air had to be pumped in.



Here water that has burst into the tunnel is being driven into the mouth by a great pump. Flooding was one of the greatest troubles during the work.



Not only was air driven in for breathing purposes, but the locomotives used by the workmen in making the tunnel were driven by compressed air.

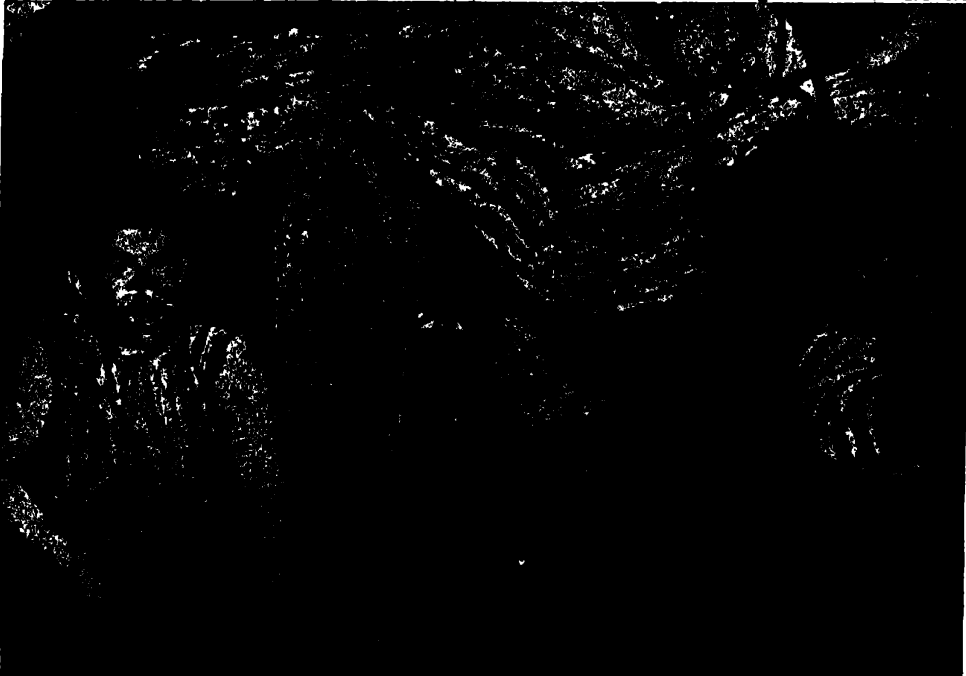


In the heart of the mountains, especially where hot springs were tapped, the heat was so intense that only by means of spraying cold water upon the walls to cool them, was it possible for the men to work.

## A HORSE IN THE HEART OF A MOUNTAIN



This picture shows a horse inside the Alps. Our ancestors would have laughed at such an idea. Owing to the difficulties of photographing in the tunnel, the front of the horse is larger than it should be.



While the tunnel was being bored, the roof was supported by huge wooden beams; in some parts the pressure of water and loose rock was so great as to break massive beams, and even bend steel girders.

## A THRILLING MEETING INSIDE THE ALPS



By means of a theodolite, which is the surveyor's chief help, the workmen were able to start boring on both sides of the Alps, and they met in the middle. The last wall of rock is about to be pierced.



This illustration shows one of the most thrilling moments in the making of the great tunnel. The workmen on the Italian side have just pierced the last rocky barrier that separates them from their Swiss comrades.

## WHERE THE TRAINS COME BACK TO LIGHT



The Simplon Tunnel, the longest in the world, runs through the Alps from Brigue in Switzerland to Iselle in Italy. This picture shows Brigue, and on the left can be seen the double entrance to the tunnel.



This is the Iselle entrance to tunnel. In boring this passage, one of the world's greatest engineering feats, 3,740,000 holes were drilled, 1,496 tons of dynamite exploded, and 1,229,500 cubic yards of rock excavated.

CONTINUED ON PAGE 6311.

# The Book of THE UNITED STATES

## WHAT THIS STORY TELLS US

**Y**OUR editors have admired Sir Walter Raleigh from their boyhood, and in other volumes of our book you will find much said about him. His most important claim to the admiration of American boys and girls has been hardly mentioned, however, and this story will tell you why Americans should respect his memory. He had the idea of building up a new England in America, and gave much of his money, and spent much of his time to bring it about, only to fail in the end. The failure was not his fault but was a great grief to him. The story of the "Lost Colony of Roanoke" is one of the most romantic in American history, and we wonder about the fate of little Virginia Dare.

## THE LOST COLONY OF ROANOKE

**T**HE first expeditions to the New World were not sent with the idea of permanent settlement. They spent their time looking for the passage to India and China, or else sought only gold and silver. Walter Raleigh, and his half-brother, Sir Humphrey Gilbert, were among the first Englishmen who desired to set up "little pieces of England" in America. They started with seven small ships in 1578, but whether to explore America or to capture Spanish treasure ships is not quite certain. At any rate they had a fight with the Spaniards, and returned without success. Sir Humphrey Gilbert was lost at sea, returning from a voyage to Newfoundland in 1583, but Raleigh was not discouraged.

The next year Queen Elizabeth made him a knight, and gave him permission to settle any "remote heathen and barbarous lands," still unoccupied by Europeans, giving the people who should settle there all the rights of Englishmen, including the right to make their own laws.

### TWO LITTLE SHIPS SENT OUT TO EXPLORE THE LAND

Raleigh soon sent out two little ships commanded by Philip Amadas and Arthur Barlowe. They touched Florida, and then sailed along the coast until they reached what is now North Carolina, July 4, 1584. Following the coast they came to a gap in the sand banks which fringe the

CONTINUED FROM 6142

coast and entered Pamlico Sound. They landed upon an island, which to their eyes seemed a paradise. The stately pines, the cedars, and the abundance of grapes, which they reported grew down to the water's edge, so that "the very beating and surge of the sea overflowed them," filled them with wonder. Game and fish were also plentiful. The Indians called the island Roanoke.

The Indians were friendly and brought them fish, and were much pleased with a few trifles given them. The explorers visited the Indian village, and were charmed with all they saw. Two of the Indians agreed to go to England with them. The name of one was Manteo, and the little town on the island to-day bears his name. The whole country was named Virginia, in honor of Queen Elizabeth, sometimes called the "Virgin Queen."

Sir Walter Raleigh was delighted with the report of his explorers, and early in 1585 sent out over a hundred men under Ralph Lane to found a colony. Unfortunately Sir Richard Grenville, who commanded the ships which took them over, quarreled with the Indians and set fire to their corn.

### THE FIRST COLONY AT ROANOKE DOES NOT PROSPER

The little colony built a little fort, but seems to have spent more time exploring and hunting gold than in planting crops. Some of them followed the broad Roanoke River, hop-

ing to find a passage to China. One of the party was John White, who had some skill in drawing. He made pictures in water-colors of the Indians, at work and at play, and of their houses. Some of these were published at Frankfurt, in Germany, in 1590, five years after they were made, to illustrate the story of the expedition, written by Thomas Hariot, the famous mathematician. Both story and pictures tell us much of Indian customs, before they were changed

been delayed, only to find the island uninhabited. He could not believe that all the men were dead, and did not guess that they had gone back to England. He thought that they were somewhere on the mainland, hunting gold or trying to get to China, and so he left abundant supplies, with a guard of fifteen men, and sailed back to England.

All England was then stirred up over the war with Spain, which all saw was coming, but Sir Walter Raleigh would



This is one of John White's pictures, showing in the foreground two Indian hunters, and behind other hunters chasing the deer. You can easily distinguish the figures he drew from life and those for which he drew upon his imagination. The physical strength of these men seems to have impressed the artist very much, and he brings out their muscles very carefully.

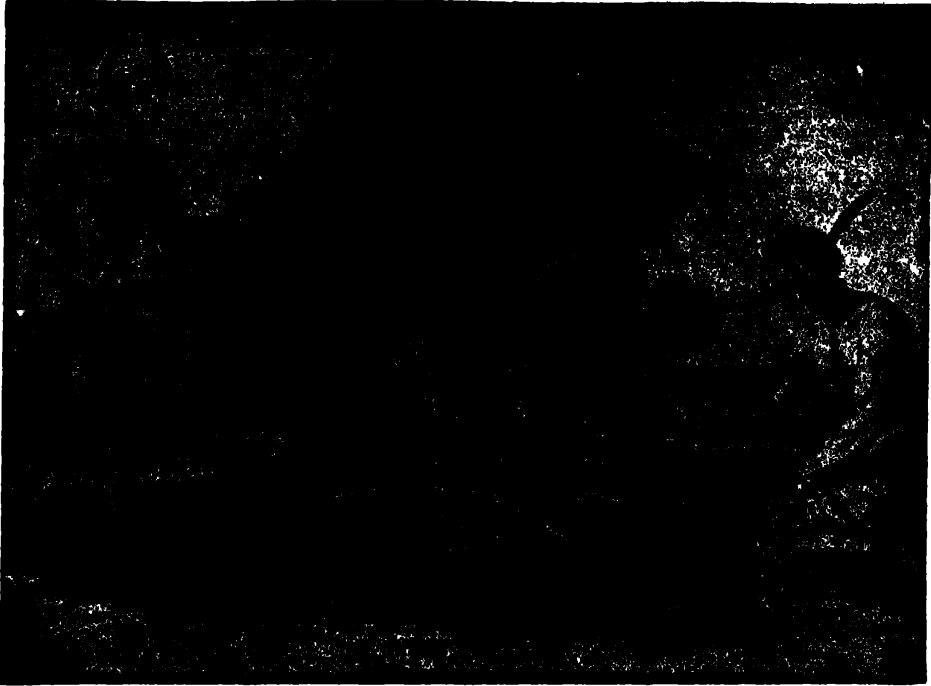
by the white men. The pictures themselves are in the British Museum in London. We show you here some photographs of the drawings.

As the Indians refused to sell their corn, the party began to suffer for want of food the next year, and the expected supplies did not come from England. Just at this time Sir Francis Drake, of whom you may read on page 862, stopped on his way home from an expedition against the Spaniards. He agreed to take the hungry, homesick men home, as they asked, and the island was deserted.

A little while later Sir Richard Greenville arrived with the supplies which had

not give up the idea of planting a colony. So in the next year, 1587, he sent out another colony, of about one hundred and fifty men, women and children, under John White, who drew the pictures we show you here. Governor White was ordered to go to Roanoke Island, get the supplies and the fifteen men left there the year before, and then go further north into Chesapeake Bay, where there were better harbors. The commander of the ships, however, was anxious to get back to Europe, and after a part of the men had gone to Roanoke Island in a small ship, he landed all the rest on the coast, and sailed away. So the third colony was forced to settle in the same place.

## HOW THE SOUTHERN INDIANS COOKED



The methods of cooking among the Indians seem to have interested the first Europeans who came to America very much. The two pictures on this page show that the Indians on the North Carolina coast did not suffer for want of food. The earliest explorers tell us all kinds of food were plentiful. Here we see the preparation of a sort of stew, of fish, green corn and other things hard to recognize.



The waters of North Carolina to this day abound in fish of every description, and here is the simple method of cookery common among the Indians. Several varieties seen in the picture may be recognised by every one who has studied fish. The report of Sir Walter Raleigh's first expedition says that an Indian caught all that the ships could use in a very short time. Several were entirely new to the Englishmen.

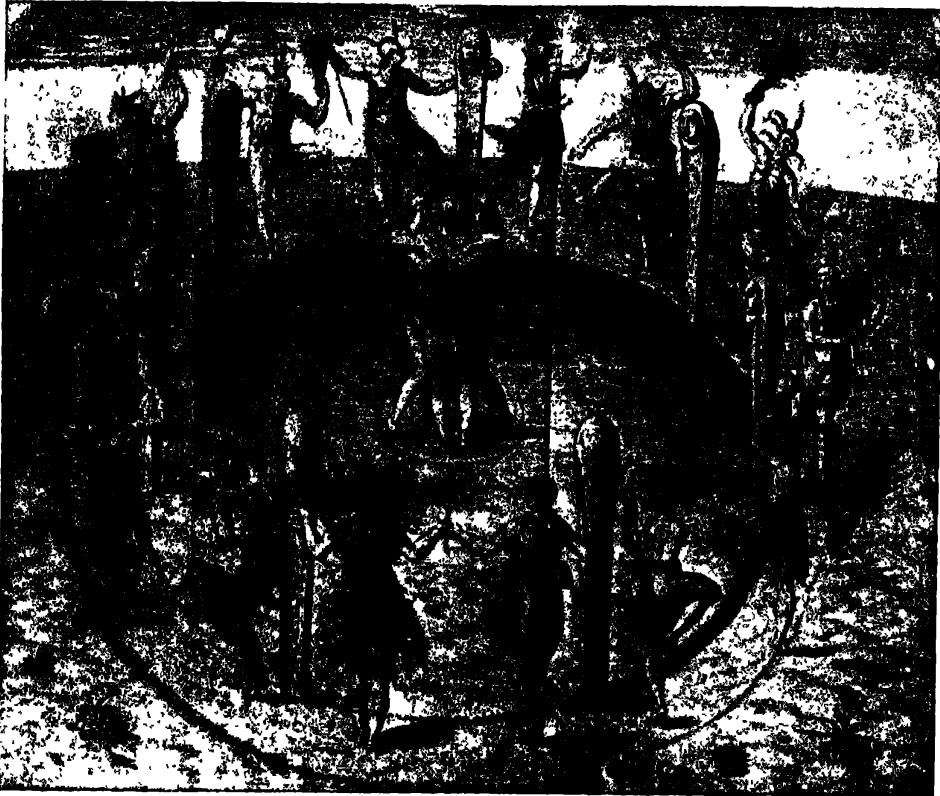


# THE THIRD COLONY, AND LITTLE VIRGINIA DARE

The party looked in vain for the fifteen men and the supplies, when it reached the island, but found only a skeleton here and there. The Indians had killed the men and taken all of the supplies they fancied. Since the ship had sailed away, the colony had to remain, and all set to work to build huts. In the party was the governor's daughter, Eleanor White, who was the wife of Ananias Dare. To

in order to live. Governor White, therefore, thought it necessary to take the one little ship left them and start back to England for help, when his little granddaughter was about a week old.

When he arrived in England the great Armada, which Philip of Spain expected to conquer England, was almost ready, and every ship in England was being prepared to fight. Sir Walter Raleigh made two attempts to send aid to his little colony. Once the ships were seized for



We are told that this picture represents a solemn festival dance among the Indians of what is now North Carolina, as seen by an Englishman more than 325 years ago. The savages, almost naked, danced around the circle of posts, striking them with their rattles as they passed. The one who could dance the longest and jump the highest was considered the winner.

them was born, August 18, 1587, soon after they landed, a little daughter whom they named Virginia in honor of the country. This little girl, Virginia Dare, was the first child born of English parents in what is now the United States. The county of North Carolina, of which Roanoke Island is a part, is called Dare County in her honor.

Since the Indians had not only killed the men, but had taken or destroyed the stores and supplies they were set to guard, the colony had great need of many things

the government, and the second expedition, under Governor White, was driven back by Spanish ships. Then came the Armada, about which you may read on page 862, and there were many months of fighting, in which Raleigh had a prominent part.

Finally poor Governor White, who must have been almost distracted, arranged with a sea-captain sailing to the West Indies to take him as a passenger, and to stop at Roanoke Island on his return voyage. Finally, in August, 1590,

when his little granddaughter would have been three years old, he reached Roanoke Island.

# **G**OVERNOR WHITE DOES NOT FIND HIS GRANDDAUGHTER

On the island there was not a sign of human life; the doors of the huts stood open, and grass grew in the fort. Chests and boxes which had been buried had been dug up. Some of Governor White's books and drawings had been scattered to the winds. There were no signs of a

Before his death the colony of Jamestown had been founded by others and the weak little colony managed to exist.

# **W**HAT BECAME OF THE LOST COLONY OF ROANOKE

The settlers at Jamestown, after their arrival in 1607, were told that this colony had lived peacefully among the Indians for several years, adopting the Indian mode of life. Finally the medicine-men had stirred up the tribe to murder all except four men, two boys and a girl.



Though Sir Walter Raleigh's attempts to found a colony in the New World failed, he was not forgotten. When North Carolina became a state it named the new town, built for the capital of the state, Raleigh, in his honor. This is the dignified capitol building in the centre of the town which reminds the people of the state of the great man who tried so faithfully to settle the country.

Photograph by Brown Bros.

struggle, and the only clew was the word CROATOAN carved deep on a great tree.

The ship proceeded toward that place, but one of those severe storms common on that coast sprang up and after beating about for several days the captain, in spite of the prayers of the father and grandfather, set sail for England, leaving the colonists to their fate.

Raleigh made two further efforts to find his colony, five in all, and after the failure of his last, in 1602, just before he was imprisoned, declared that he would yet see "an English nation in Virginia." He was sent to prison by James I, in 1603, and finally put to death in 1616.

Perhaps this story was true, perhaps not. If so, was this girl Virginia Dare?

To this day many believe that some of the colonists, at least, were adopted by the Indians, and married with them. As proof they point to the gray eyes and red hair sometimes seen among the Croatan Indians, who yet live in North Carolina. The Indians themselves say that they have been told by their grandfathers, who were told by their grandfathers, that their ancestors came over the sea and could "speak out of a book." All we really know is that the little colony disappeared, and has never been found.

THE NEXT STORY OF THE UNITED STATES IS ON PAGE 6387.

## A MONSTER SHIP OF THE SKIES RETURNING FROM PATROL



The balloons of twenty years ago were small affairs at the mercy of every wind. Now they carry dozens of passengers, or fighting men, their engines drive them against the wind, and their rudders guide them. This is one of the giant airships used by the British. Notice the gun mounted on top and the two propellers on the car. The markings are to enable their own men to identify them, so that they will not be fired upon by their friends. These balloons are made in sections, so that if one of the gas chambers should be pierced it would not fall to the ground. In the ordinary balloon a small hole would empty the whole gas bag.

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## THINGS TO MAKE AND THINGS TO DO

### WHAT THIS STORY TELLS US

**T**HE two great sports of the United States are baseball and football. Baseball is played by a great many more people, for thousands of boys and young men play the game at every opportunity. Fewer play football, but the public interest in the game is quite as great. The following description gives a general idea of the game, and will enable the reader to understand.

## HOW TO PLAY FOOTBALL

**D**URING the autumn months of every year, thousands of American boys and young men are playing football. It is the favorite sport in colleges and high schools, and the newspapers print long accounts of the games, some of which are attended by many thousands of spectators.

It is a rough game and a boy who is not strong should not attempt to play it. Even strong boys are sometimes hurt, and, therefore, some parents and some schools object to the game, and do not allow their boys to play. However, if only strong boys, wearing proper clothes, play the game, there is not much danger of serious injury. Players should always wear regular padded football clothes, and strong shoes which fit closely around the ankles. Nose-guards made of rubber and shin-guards are often worn, but are not absolutely necessary.

Football is a very old and very widely played game. Several thousand years ago, we know, it was played by the Greeks. Through the Romans it was passed on to the Britons. The English gave it to America, where it has, in the last thirty-five years, developed into a game distinct from any played elsewhere.

The American Intercollegiate game, played by nearly all of the colleges and most of the schools, is played upon a rectangular field, 360 feet long and 160 feet wide, enclosed by white lines marked on the ground. Two lines, 300 feet apart, are called the goal lines. In the middle of each of these is erected a goal, consisting of two upright posts 20 feet high and 18½ feet apart, with a horizontal cross-bar 10 feet from the ground. Parallel with the goal lines, white lines run across the field 5 yards apart, and these lines give the field its familiar name of grid-iron. These are the official dimensions. In games between teams of boys, however, the field is often smaller, depending on the space available; and the 5-yard lines, which are merely an aid to the referee in judging distance, are usually omitted.

The ball is an inflated rubber bladder, with a leather cover, usually made of

Continued from 6170

pigskin. It is not round, but drawn out lengthwise into rounded points at opposite ends, to make it more easily handled. The game is played by two sides of eleven men each. Seven of these men are forwards, who form the rush line, and they take positions beside one another, facing the goal line to be attacked, as shown on the diagram. The man in the middle is called the centre. At each side of him stands a guard; outside of the guards come the tackles, and outside of these, the ends. The remaining four men compose the backfield. Of these, the quarter-back stands directly behind the centre; two half-backs take their positions at the sides of, and a little further back than the quarter. Still further to the rear, and behind the centre of the line, is the full-back's place. This is, in general, the arrangement of the men when in possession of the ball and lined-up for an attack. When on the defence, while the line-men keep their positions, the backs shift to meet different plays by their opponents, sometimes playing far to the rear in readiness to receive a kicked ball. Because they take so many different positions, we do not show the defence on the diagram.

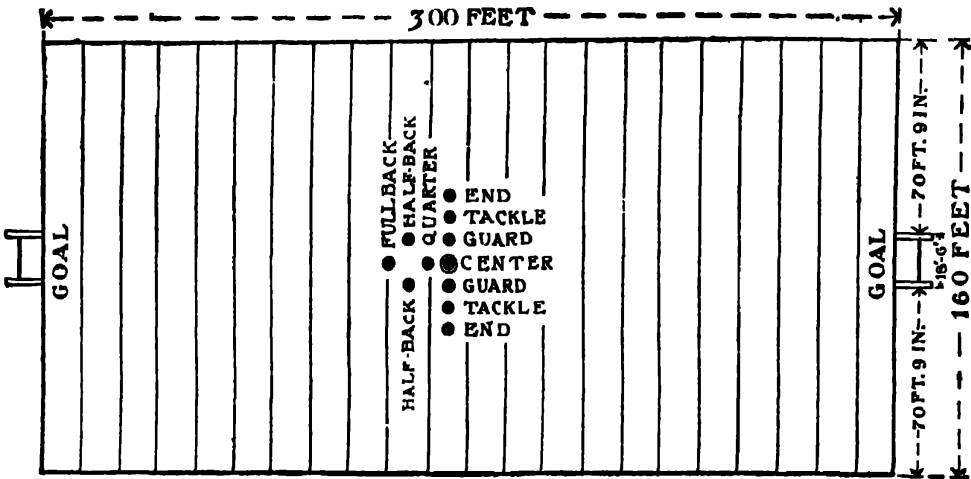
The standard length of time of a game is sixty minutes of actual playing. This is divided into four periods called "quarters," of fifteen minutes each. Between the first and second quarters, as well as between the third and fourth, there is an intermission of one minute. The period of rest between the second and third quarters lasts fifteen minutes.

Scoring is accomplished in two ways: by touching the ball down behind the goal line, or by kicking it over the cross-bar of the goal. When a player succeeds in carrying the ball across the opposing team's goal line and there touches it to the ground, it is called a *touch-down*, and counts six points. When a team has made a touch-down, the ball is brought out into the playing-field, and one of the men of that side tries a *place-kick*, that is, kicks the ball from the ground where it is held in position by one of

## THINGS TO MAKE AND THINGS TO DO

his team-mates. If the ball passes over the cross-bar, it is called a *goal from touch-down* and adds one point to the score. A *field-goal*, which counts three points, may be made without having scored a touch-down, by sending the ball from the playing-field, over the cross-bar, by means of either a place-kick or a *drop-kick*. A drop-kick consists in dropping the ball from the hands and kicking it just as it begins to rise from the ground. When any member of a team is forced to carry the ball behind his own goal line and there touch it down, his team is said to make a *safety*. This counts two points for its opponents. If, however, a team recovers, behind its own goal line, a ball kicked across by the *opposing side*, a safety is not counted. This is called a *touch-back*, it does not add to the score. After a touch-back, the defensive side has

into the charge of the *centre* of the runner's side. His team-mates line up at the sides of the centre on a line even with the ball and parallel with the goal line in the manner described before when speaking of the players. Opposite them, their antagonists line up. Both sides are now ready for a *scrimmage*. At the signal, the centre snaps the ball to the quarter-back, who passes it to the man in the back-field who has been called on to advance the ball by *rushing*. The rusher tries to carry the ball either through the line or around one of the ends. When he has been stopped, the ball is said to be *down* for the second time. Four such *downs* are allowed, in which to make a gain of ten yards. When ten yards have thus been gained, it is again called *first down*. Thus, the team continues its progress toward the enemy's goal, unless it either



The Field Laid Out for Football.

the privilege either of carrying the ball out to its own twenty-five yard line, and there putting it in play, or of kicking out to its opponents from any point within its own twenty-five yard line.

The two captains having decided the choice of goals and kick-off by tossing a coin, play begins with a kick-off from the kicker's forty-yard line. The players of this side line up even with the ball. One of their number, after a short run, kicks the ball into the territory of the enemy, who have scattered about their half of the field in readiness to receive the kick. The man who catches the ball starts on a run toward the hostile goal, protected as much as possible by his comrades, and striving to evade his opponents, who have come charging down the field as soon as the ball has been kicked. If the runner succeeds, by dodging, in making his way through the ranks of his opponents and crosses their goal line, he has scored a touch-down. Usually, however, he is tackled and thrown. When his course is thus arrested, the ball is said to be *down*. In that case, the ball is given, at that spot,

loses the ball on a fumble, or fails to gain the required ten yards in four tries. When a team perceives that it will not make the necessary ten yards in its four downs, the practice is not to rush the ball on the last down, but to kick it so as to place it as far away from their goal as possible. In either case, the ball comes into the possession of the other side, which now makes its attack in a similar way. A *forward-pass* may be made from scrimmage formation by any man in the back-field, and may be received by an *end*, or by any man who was in the back-field when the ball was put in play. Such a pass may be intercepted by any opponent.

Regarded as *fouls* and forbidden are: off-side play, that is, getting in front of the ball; holding or tackling any one but the man with the ball, tripping, striking, or kicking a man; "piling up" on a "downed" player. Boys who wish to play the game in earnest should get the book of rules and study them, and better still, get some person who knows the game to teach it to them. Football is hard to learn from a book.

## MAKING A SET OF BOOKSHELVES

IN proceeding with our carpentry work, we must not try to advance too rapidly. We shall do better work if we make very simple things at first. Another point to keep in mind is the utility of the articles we set ourselves to make. Our work is likely to be more thorough if we know that it has to stand the test of perhaps daily use. Here we shall see how to make an exceedingly useful article—a set of hanging bookshelves—which we can attach to the wall.

Everyone needs an article of this kind, and everyone with ordinary intelligence and the necessary tools can make one. The sizes given in the sketches are good useful sizes, but the best sizes for the article to be made depend upon the space available for its accommodation.

Many of us remember how the Vicar of Wakefield had his family's portrait painted, and then found the canvas so large that it had to stand against the kitchen wall. Thus everyone who makes the bookshelves from these sketches must first decide if these sizes are the best in his individual case, and if they are not he must modify the sizes given to suit his own case.

We have first to decide what kind of wood we shall use. We could use oak, beech, or birch—perhaps oak looks better than the other two for the purpose—but all these are hard woods, and it will be much easier for us to use a soft wood, such as pine. Hard woods are much more difficult to work. We can use soft wood, and after the shelves are made we can stain them to imitate any of the harder and more expensive woods.

In picture 1 we show one side of the hanging bookshelves with all the sizes marked on it. We first cut out two pieces of the wood we are using—pine, for instance—to this shape. They must be fairly strong, and we should make them so that the finished thickness shall be not less than one inch, so we had better use wood  $1\frac{1}{2}$  inch thick and reduce it to one inch by planing it. The holes in the sides we can make with a chisel, and we must be particularly

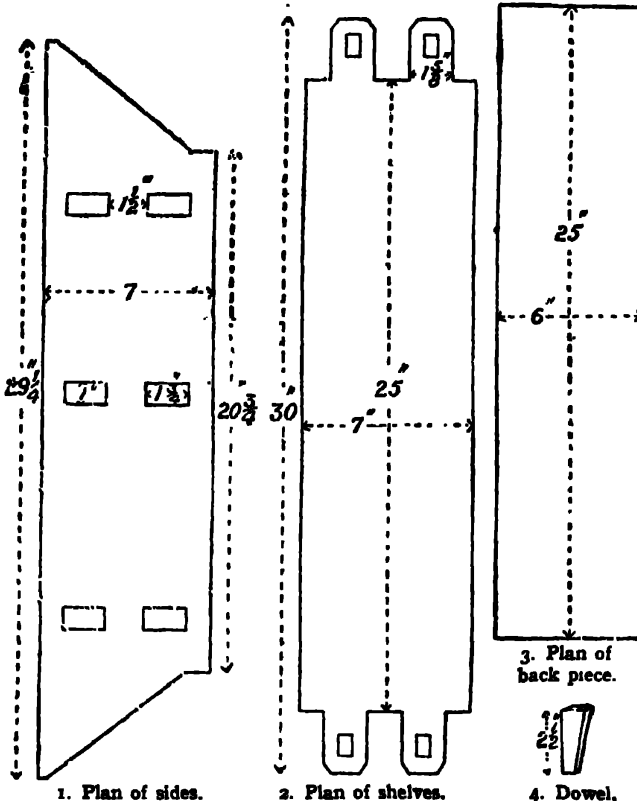
careful that each pair of holes is exactly in the same horizontal line, so that the shelves may be quite flat. It is safer to make the holes a little small at first, for it is very simple to enlarge them if necessary. We must also see that the two sides are exactly alike. Having cut the two pieces, we must finish them carefully with the plane so as to have them true and smooth, afterwards rubbing them well with sand-paper, or glass-paper, these being two names for the same material. We should use No. 1 sand-paper first, rubbing the surface and edges carefully until they are as uniformly smooth as the sand-paper can make them, and then we use No. 0 sand-paper, which will give them the final touches. It is more important to

have the sides smooth than it is to have the shelves smooth, because the former are more exposed to view.

Having made the sides, we turn our attention to the shelves, of which we shall make three. We shall make them all alike, and thereby simplify matters. Picture 2 shows the shape and the sizes which we should make them. The thickness of these pieces when finished should not be less than  $\frac{1}{4}$  inch and preferably  $\frac{1}{2}$  inch, so that the wood, when we begin, should be thicker than this, to allow us to have this thickness when the planing and

sand-papery are finished. Having made the shelves, we fit them into the sides so that the ends go through the holes we made in the sides, and if they do not quite fit we must make them fit. We shall want twelve taper pins, or *dowels*, for the holes in the ends of the shelves to cause them to retain their position in the sides, and these pins we can easily make. It will be much better if they are of hard wood—oak, beech, birch, mahogany, or walnut, for instance—even if the sides and shelves are of soft wood. There is more strain upon the dowels than upon the other parts, and as they are smaller, strength is necessary. The shape and size of dowel necessary are given in picture 4.

The shelves would do as they now are,

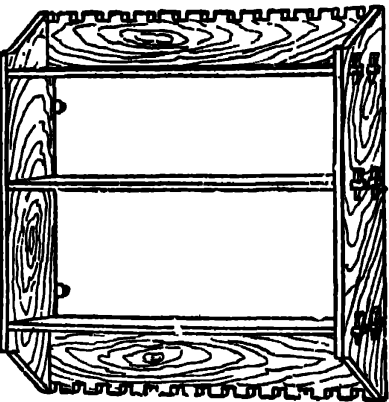


but would be liable to twist unless we strengthened them, and we shall do this by two back pieces, one above the top shelf and another below the bottom shelf. Picture 3 shows the sizes for these pieces, both of which are alike. Having cut them out and finished them, we nail them on, one above the top shelf and one under the bottom shelf. The set of shelves is now complete as far as carpentry goes. If we buy at the hardware merchants' 4 mirror plates, we can attach the shelves to the wall by their means. We must attach these mirror plates to the sides and not to the shelves. We put two at each side, as seen in picture 5. These would do well enough if they were put on to stick outwards, but in that case they would be seen when the shelves are attached to the wall. By putting them on as indicated in picture 5, the books will hide them and the shelves will look much better when they are fixed in the place they are to occupy.

If we have used pine or other soft wood, we can stain the shelves any color we prefer, and can imitate mahogany, rosewood, walnut,

or ebony. We purchase any of these stains in either small or large bottles, and apply it with a brush. Then we can put on some French polish if we wish to give the article an extra fine finish and can afford the modest

expense. There are several other ways in which we can ornament the bookshelves. We may, if we like, make the top and bottom pieces "embattled" or "dentilated," as it is called, by cutting out pieces and leaving teeth-like projectors as shown in picture 5. We can carve the sides, or we can stain them with a pattern, using stencils, or we can burn some ornamentation, using a hot iron, or, finally, we can, if we wish, put some ornamental or imitation leather shelf-edging along the front of the shelves. Whether we decide to decorate in any



5. The completed bookshelves.

of these ways or not, we shall have an article of wall furniture which we shall find very convenient, and of which we shall feel very proud, because we have made it ourselves, but it will considerably add to its appearance if it is decorated with some simple design.

## THE MYSTERIOUS CHINESE BAT

THIS is a miniature cricket-bat, 6 in. long, as illustrated in the picture. In a row down its centre, about half an inch apart, are three small holes, visible on each side, and bored, apparently, right through it. But things are not always what they seem, especially in conjuring. A comparison of picture 1, representing a front view, and picture 2, representing a back view of the bat, will show how, in this case, the reality differs from the appearance. Of the three holes, A, B, and C, shown in the front view, only B and C are genuine, so to speak, A being a mere make-believe, going only half-way through the wood. On the other side of the bat, in a line with B and C, but half an inch nearer the lower end, is another dummy hole, D.

With the bat is used a little peg of wood, bone, or ivory, in length about three times the thickness of the bat, and just fitting comfortably into either of the holes B and C.

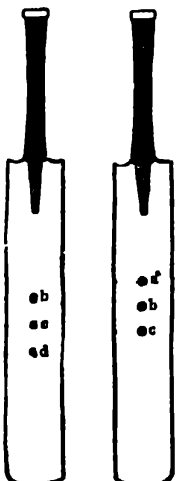
To show the trick, we, in the first place, call attention to the bat, asking the company to notice that there are three holes through it, as appears to be the case. We likewise exhibit the peg, which we may introduce with the remark that some of the company have no doubt seen the curious "jumping beans" which have been such a puzzle to naturalists, and that this little peg is a "jumping peg." Whether the motive power is the same in both cases you must leave the audience to decide.

We may here remark that whenever a conjurer can introduce in his "talkee-talkie" of a trick some little scientific fact having a resemblance, however remote, to the effect he is about to produce, he should not fail to do so. If we can start people on a wrong scent, they are all the less likely to hit upon the true one.

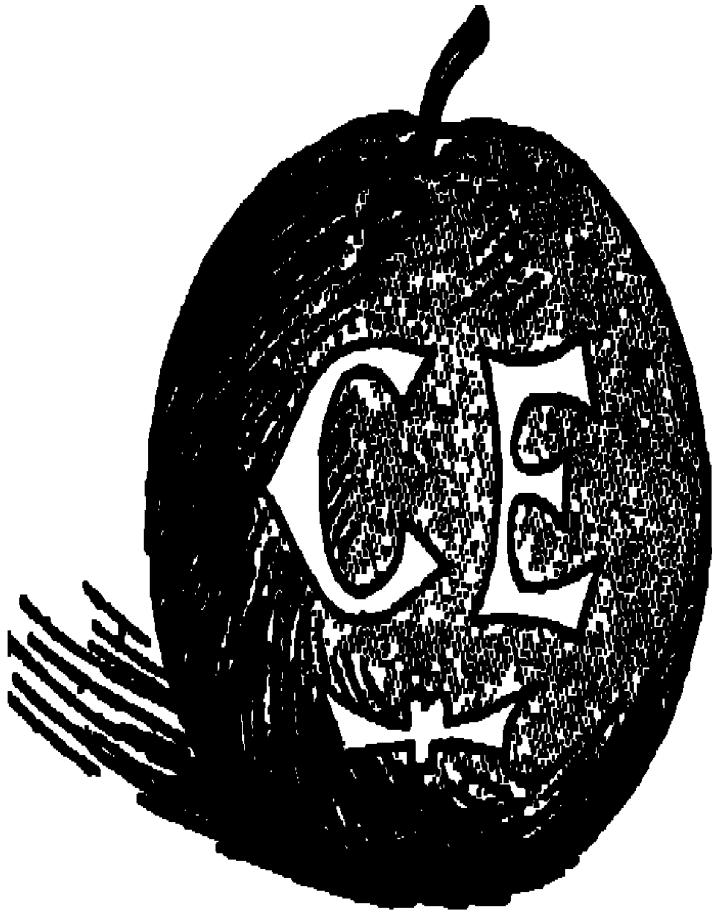
But to return to our jumping peg. The performer puts it, from the front, into the hole B in such a manner that it shall project equally on each side. Holding the bat upright, he asks everybody to take notice that he has put it in the centre hole. He then lowers the bat as if to show the opposite face of it but, as he does so, gives the handle a half-turn between his fingers. The effect of this is that the same side is still visible.

"Now," he says, "I shall command the peg to jump out of the middle hole and into the top hole." Under cover of a wave of the arm, he gives the bat another half-turn, thereby bringing the reverse side into view. On this side B is the top hole; and the peg appears to have jumped accordingly.

"Once more," he says, "we will place the peg in the middle hole." He then transfers it to C, which on the side now visible is the middle hole. Again he shows, apparently, both sides of the bat then commands the peg to jump, and makes the final half-turn as before, when the peg is seen to have jumped into the lowermost hole.



1. Front view. 2. Back view.  
The mysterious bat.



**APPLE WITH MONOGRAM**





THE  
HUMAN  
CONDITION



2. The dancing Highlander.

asked by the audience, Bottom of the bag 1.





## THE STONE IN THE ROAD

THERE once lived a king who ruled his subjects so wisely and so well that his fame spread near and far.

But everything was left by the people for someone else to do, and at last the king decided to teach them a lesson.

Now, it happened that one of the roads that led to the town passed through a hill. To this spot the king went late one night, and scooped a hollow right in the middle of the cart-tracks. Then from the folds of his cloak he took a small bundle, and placed it in the hole. Going to the side of the road, he loosened a large stone, which he rolled to the hole he had made in the road. There he placed it, so that it completely covered the opening.

Next morning a farmer driving his cart came that way.

"Ah," he cried, "the laziness of those people is terrible! Here is this big stone right in the middle of the road. I dare say it has lain there long enough for someone to have moved it. But no! everyone is too lazy to attend to such a simple matter." So saying, he pulled his horses to one side till his cart grazed against the side of the hill, and so passed on.

Presently down the road came a soldier. He sang gaily as he marched along; but his head was too far back

CONTINUED FROM 6196

for him to notice the stone, and in a moment he was sprawling in the roadway. He

picked himself up, grumbling at people's carelessness, and walked on. But he left the stone where he found it.

Later some merchants, with pack horses heavily laden, passed that way.

"This is a fine country!" said one. "I wonder how long that big stone has been lying there." But not one of them thought it worth while to move it out of the way, but the company divided and passed to right and left of it.

Thus it went on day after day, and no one even attempted to move the stone, though everyone blamed his neighbor for letting it lie. When three weeks had passed, and it still lay in the road, the king sent word to his people to meet him at this very spot.

"My good people and faithful subjects," he said, "it was I who put this stone here; and for three weeks everyone who has passed has blamed his neighbor for not moving it."

Then he lifted the stone, and showed them the hollow place beneath, in which lay a small bag labeled: "For him who lifts the stone."

He undid the string and a stream of golden coins fell out. After that no man in that country left the immediate task for his neighbor to perform.

## THE WONDERFUL FRIENDS

A SHEPHERD lad was once sent by his father to carry food to his elder brothers, who were in the army of the king, encamped before a powerful enemy. When the young boy arrived, he found everywhere dismay and anxiety. For the champion of the other side had challenged any of their host to combat, and so mighty was he that none had dared to answer.

"Who is this man," inquired the shepherd lad, "that he should defy the armies of the living God?" He offered to go himself, and was brought before the king, and the king, after speaking to him, had him dressed in his own armor. But the lad said, "I cannot go with these, for I have not proved them." And he put them by. Then he took his shepherd's staff and his sling, gathered some smooth stones from the brook, and went out to meet the champion.

When Goliath, the mighty warrior, saw him, he was enraged, and cursed him in contempt. But the young patriot replied, "You come to me with a sword and a spear and a shield; but I come to you in the name of the Lord of hosts, the God of the armies of Israel, whom you have defied. This day will the Lord deliver you into my hand." And as the warrior bore down upon him he fitted a stone to his sling, and, whirling it about his head, let fly; and the stone struck Goliath on the forehead, and he stumbled and fell upon his face to the earth. Then the lad snatched the fallen hero's sword, and smote off his head. When the Philistines saw their champion was dead, they fled. But among the Israelites in an instant despair had changed to confidence and enthusiasm.

With a shout of joy, the army of Israel arose, and, flinging itself upon the enemy, drove them away in utter confusion.

Then the King of Israel inquired about the shepherd boy, but none could tell his name. "Inquire whose son the stripling is," he said; and presently the boy was brought before him, with the head of the giant in his hand, to answer for himself. "I am the son of thy servant Jesse the Bethlehemite."

Beside the king was his son, and this gracious young man, regarding the shepherd boy as he spoke to his royal

father, felt his soul suddenly knit with the handsome lad's, and there and then loved him as his own heart. So he spoke to the king, and the king said that the lad David should no more return to his father's home, but should live with him in his palace, and be a soldier instead of a shepherd. And the king's son, Jonathan, took off his royal robe, and put it upon David, and gave him his sword, his bow, and his girdle. And he held David's hand, and looked in his eyes, and they made a vow together of a friendship which should last till death.

Life had changed utterly and completely for David in an instant. From living in a humble cot, he went to live in a king's palace. From being a shepherd of the hills, he was a captain of soldiers.

What dreams of glory must have crowded the lad's brain! It seemed as if there was no height to which he might not soar, no fame he might not earn, no happiness he might not now enjoy.

In all the glory and honor which now invested him, there was one thing far more gracious and more glorious than all the rest, and this was the deep love of the king's son. Clothed in such a love, as with a kingly robe, the young David was something more than warrior and hero.

What Julius Cæsar was to the Romans, what Napoleon was to the French army, this and more was David to the hosts of Israel. The spell of the man's *soul* was over the people, and in him they beheld a captain from heaven, whose right hand was terrible with victory. So, wherever David went with the army, triumph followed, and, on the return of the soldiers, the streets were loud with his name and with music to his honor.

In this glory of young David, Jonathan rejoiced with all his noble and generous nature.

But the people shouted, "Saul has slain his thousands, and David his ten thousands!" And this cry pierced the king's chamber, and struck on his soul like the voice of Destiny. From that day Saul regarded David with growing jealousy.

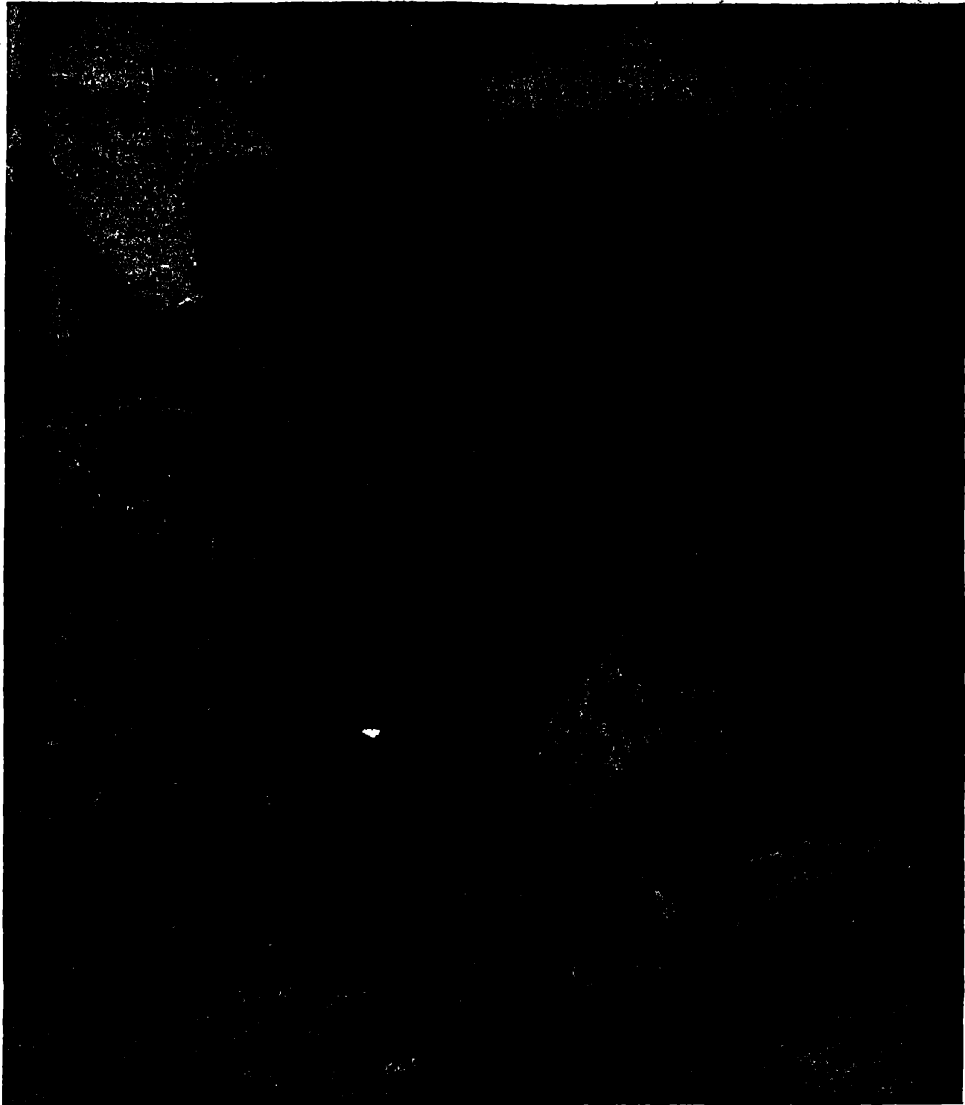
Slowly it came to the mind of the king that David was his enemy. At first he

## THE WONDERFUL FRIENDS

had been envious of the praise showered upon his favorite; then he became suspicious. He regarded him as plotting for the throne of Israel.

He spoke about this idea to Jonatnan and his courtiers, saying that David was dangerous to the royal house. But

But, in a war that soon followed, David was again so successful that the king's suspicions returned, and, with his own hand, on a sudden impulse of hatred, as he sat with his successful captain, most basely the king sought to kill him with a javelin. Then David fled away from



Courtesy Tisot Picture Soc., N.Y. Copyright by de Brunoff, 1904.

### THE STONE FROM DAVID'S SLING STRUCK FULL IN THE GIANT'S FOREHEAD

Jonathan, after he had warned David to lie in secret for a little space, went to the king and spoke so convincingly of David's honor and of his service to the nation that the king put away his suspicion, and said, "As the Lord liveth, he shall not be slain." So David returned to the court and lived as before.

the court that night back to his own house.

Jonathan came to him in secret, and the two friends comforted each other. Then Jonathan returned to soften the king's wrath against David. But when he spoke to Saul, the king this time burst out upon him with violent rage, bidding

him see that he would never succeed to the throne while David lived; and admonishing him to throw aside a treacherous friend, and to try and protect his own interests while there was still time.

To all this Jonathan replied, "Why should he be killed? What has he done?" And this gentle answer so enraged the king that he hurled his javelin even at Jonathan.

Then Jonathan saw that it was in

and wept together, till David was unmanned, and broke into tears.

Then Jonathan comforted the mighty conqueror, valuing his friendship more than life. "Go in peace," said he; "go in peace, because we have vowed, both of us."

Many years afterwards, when David, having gone through a multitude of adventures, was become a king himself, he heard how Saul and Jonathan had died together in battle. The news broke



The king's son felt his soul suddenly knit with the soul of the handsome lad.

vain to plead, and unsafe for David to be within reach of his father's arm. So he approached David in secret, by a signal agreed upon by them beforehand, namely that Jonathan would shoot three arrows as if at a mark. If he said to his attendant, "The arrows are beyond thee," it would mean that his news was bad. Then David fell upon his knees, bowed his head to the ground, and waited for Jonathan.

Jonathan came near, took David into his arms, and they kissed one another,

him down, and he cried out, "The beauty of Israel is slain!" and he forgot his own wrongs that he had suffered at the hands of Saul and said, "Saul and Jonathan were lovely and pleasant in their lives, and in their death they were not divided." Then the old friendship with Jonathan, with all its fragrance of innocence and youth, returned to him, and he mourned for his friend, "I am distressed for thee, my brother Jonathan. Very pleasant hast thou been unto me. Thy love to me was wonderful!"

## THE GREY TERROR

### THE FIRST BOY WHO PLAYED WITH A DOG

AFTER Swar's adventure with the lioness, the men and women in the camp were very watchful over the son of their chieftain. He was never allowed to go out alone beyond the camp where Cornhill now is. It was not till the Grey Terror arrived that he had any more exciting adventures.

"Game is getting wonderfully abundant," said Wawa, one morning, late in autumn, to his wife Bina.

Only a few minutes before he had gone out hunting, and he had returned loaded with spoil. The river swamp was crowded with wild sheep and elk and horses and oxen and deer. That day the tribe got enough meat to last them till the winter months. Everybody was wild with joy, except Wawa.

"Something terrible must be happening on the south side of the river," he said that evening, as the tribe was eating round the great fire on the top of the hill. "I went down to the ford. For a quarter of a mile the river is black with animals swimming madly across to the northern wilderness. They are all going toward the north, and the tribe will have to go with them or starve."

"Why?" cried all the men.

"I do not know why," said Wawa; "but I will soon find out."

He took his heaviest stone axe and his best stone dagger, and tied them round his waist. He then stripped himself of all his skins, and dived into the river, and struck out for the southern shore. None of the men and women of the tribe slept that night.

When morning came, there was no need for them to go out hunting. Herds of terror-stricken beasts came charging up the hill and sweeping through the camp, overturning the skin tents and scattering the tribe. Everything was in confusion when Wawa came limping up from the river. His stone axe and dagger were gone, and he was wounded in the leg.

"Don't trouble about the tents!" he shouted. "The Grey Terror is coming, and there is no time to escape! Out in the jungle for your lives, and get wood to make a great fire round the camp! Out, I say! Out, all of you—men, women and children—and collect brushwood!"

No one had ever seen Wawa look so terrible as he did then. No one dared to wait and question him. All the tribe rushed into the jungle, the children following their mothers, as Swar followed Bina. They helped to tear down the brushwood, while the men hammered with their stone axes at the smaller trees, or lighted fires at the roots in order to burn through the trunks. And the piles of brushwood grew higher in the circle around the camp, but Wawa would not let them stop. "More," he said, "more. We shall need every stick in the jungle."

At this awful moment Swar took it into his funny little red mop of a head to trot away into the swamp and see what was the matter with everything. Bina, of course, missed him, but thought he was with his father; while Wawa, who was limping round the camping-place and studying where to make the circle of fires, naturally fancied that his son was busy with his wife collecting wood.

All the jungle swamp was now empty of large animals. They had fled into the northern wilderness. Swar took the track toward what is now Hampstead, which he had followed on his first voyage of exploration. There was no sound to be heard save that the grey monkeys chattered in the tall forest trees as he passed by, and great long-legged storks, searching for frogs in the pond, slowly flew away at his approach.

"I don't know what I shall hunt to-day," said Swar to a monkey that was peering curiously at him from the lowest branch of a fig-tree. "Could you tell me where I could find the Grey Terror that daddy spoke of? I must kill it, because it is frightening mummy, and then I will wear its skin when my lion robe is torn."

Swar thought that the monkey would understand him. It looked such a quaint human creature, as it peeped down at him, that he was sure it was some strange sort of child. By a stroke of wonderful luck, the monkey that morning happened to be in a mischievous mood. Plucking a large juicy fig, it threw the fruit at Swar, and struck



SWAR FOLLOWED THE MONKEY FROM TREE TO TREE

him plop! on the face. In the twinkling of an eye Swar had made up his mind. This grey, ugly thing which threw figs at you when you asked it a question was surely the Grey Terror itself, he thought.

He was up the tree in a minute. No man or boy of modern times could climb with the agility that this primitive little savage displayed. He was almost equal to the monkey at its own game. He followed it from tree to tree, never touching the ground once, but swinging from branch to branch, like a little human ape. Sometimes he stopped to breathe and nestled in the forking branches of a tree, and made a meal on nuts and figs. And there, in the tree beyond him, squatted the monkey, imitating his movements, and feeding on

what he fed on. It made Swar angry and he kept chasing the animal till nightfall. By that time he was so tired out that he fell asleep over his last meal, and the monkey came and squatted beside him, high in a branching oak-tree, and put its hairy arms gently round the sleeping boy.

All that night there was a strange noise in the silent forest. Pitter-patter, pitter-patter it went on the leaf-strewn ground. Now and then the shriek of a rabbit was heard. And once, as the autumn moon shone for a moment the light from it fell on a vast, grey, moving mass, which was silently sweeping through the forest. A thousand glittering eyes instantly looked up, and the strange stillness of the jungle was suddenly broken by a loud, wailing cry from a thousand red throats. Then the clouds came together, and silence and darkness again fell on the forest, and the

pitter-patter, pitter-patter noise gradually died away.

Swar was very angry when he awoke in the cold dawn, and found the monkey's arm around him. He did not think what it was that had kept him warm all night and he had forgotten all about the Grey Terror. But he felt hungry and lonely, and he wanted to get back to his father and mother.

"I don't want to play with you," he said, as his strange bed-fellow began to gambol about the tree and chatter to him. "I'm going back to the camp."

He climbed down from the oak-tree, and set out to find the camp by the river. As you can guess, he was a good distance away from his home. Happily, his father had taught him how to guide himself by the position of the sun, and

after a tramp of four miles he came to the shore of the Thames at the place where Chiswick now is.

"Now I know my way home!" he said joyfully.

And, turning right to the east, he trotted along the river-bank towards Westminster. Of course, there was no path along the river in those distant days. The land was covered with a dead undergrowth, broken here and there by irregular tracks made by the woolly elephants and the huge buffaloes as they went down in herds to the water to drink. At Westminster, where the Thames was shallow, all the jungle for about half a mile had been trampled down flat by the huge droves of terror-stricken beasts that had fled before the Grey Terror into the northern wilderness.

As Swar was passing over this strange place, a little animal came out of a muddy tuft of reeds, and began to follow him. Swar did not notice it until it licked his bare legs, and made him turn round with a start. He had no weapon, and he gave a cry of fear, and ran away as fast as he could. The little animal easily overtook him. Instead, however, of trying to hurt him in any way, it ran by his side, and attempted to play with him. Swar at last stopped—it was no good being frightened—and looked at him in a friendly way.

"You're a funny little thing," he said. "You're like a young wolf-cub, but your grey fur is finer and softer, and you're not a bit fierce."

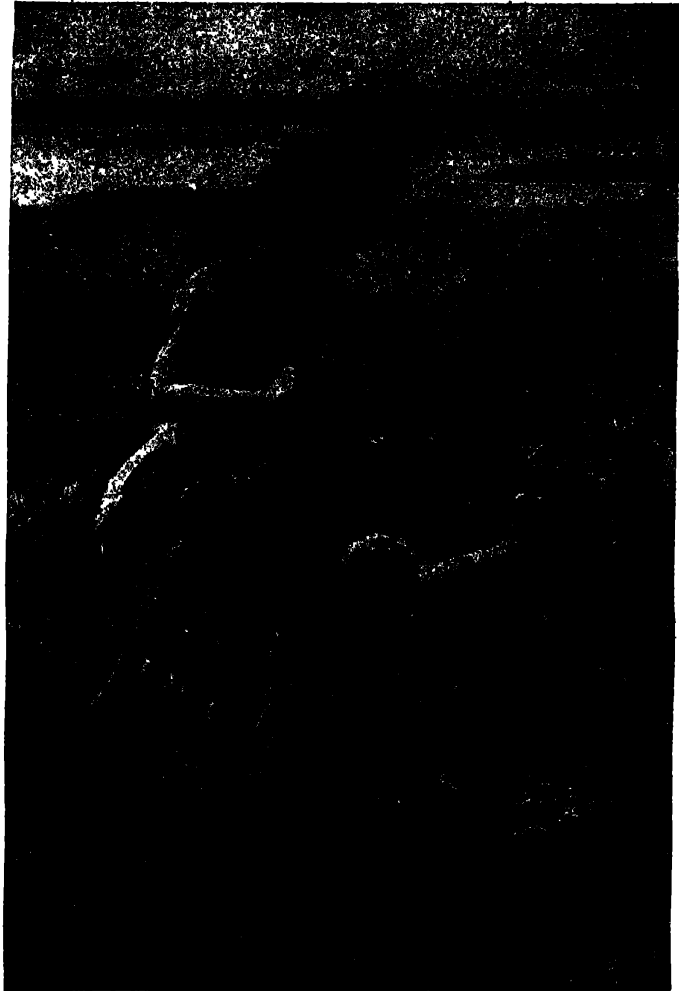
It was, indeed, only a frolicsome little puppy-dog. Swar found it a delightful playmate. They chased one another in turn from Westminster to Cornhill. Panting from the exercise, and wild with delight over his new pet, Swar at last rushed up to the

camping-place of the tribe, and shouted and capered outside the circle of burning wood.

"Joy, joy, joy!" cried Wawa. "Swar is safe! The Grey Terror has not eaten my son. Beat down the fire, men, and let him in!"

Men, women, and children hastily caught up whatever was handy—skins, sticks, and stone spears—and raked some of the burning wood away to make an entrance for the little boy. Bina and Wawa rushed forward to embrace him, but the little puppy-dog got through first, and rushed towards them, barking loudly out of sheer excitement.

"The Grey Terror—the Grey Terror! It is upon us! The river! Jump into the river! It is our one and only chance! Oh—oh—oh!" shouted all the tribe loudly, in a madness of fear.



THE LITTLE ANIMAL TRIED TO PLAY WITH SWAR



They leaped through the line of fire at the water-edge, in a wild, confused, and swift movement. Only Wawa remained behind. Lifting up his great stone axe, he sprang to the opening made in the fire circle, shouting :

"Run with your mother, Swar! There is still time. I will keep the Grey Terror back while my life lasts!"

Swar took his little puppy up in both arms, and began to run to the water as fast as his little legs would carry him.

"Kill it, boy! Kill it!" Wawa shouted to his son. "That is one of the Grey Terrors you are carrying!"

Swar stopped running in blank surprise, and looked first at his father, and then at the puppy. The little dog began to lick his face. In the meantime, Wawa had turned, and he was now gazing, open-mouthed with astonishment, at the empty jungle stretching from Cornhill to Walbrook. He had expected to see a vast, grey, surging mass of fierce beasts charging up the hill, their hungry jaws open to devour the tribe.

"This is one of them—a very little one," he said at last, going up to Swar, who, very puzzled, was sitting on the

ground, clutching the puppy as tightly as he could. "But the great herd of the Grey Terror seems to have swept northward on the trail of the forest cattle. The tribe is saved then. Where did you find this little beast, my son? Wow-wow-wow! How playful and friendly the little Terror is!"

Wawa patted the puppy, and it licked his hand, while Swar was telling his father his adventures with the monkey, and his finding the dog.

"It was well for you, my son," said Wawa gravely, "that you slept last night high in an oak-tree with your mocking playmate's hairy arms around you. The Grey Terror came sweeping up to our camp early in the evening, and even with a double line of fires we had trouble in beating them off.

"They must have passed you in the darkness when they turned north. Yes," he added, as Swar looked up to him with imploring eyes, "you can keep your little grey beast as a playmate if you like. At least, unless he grows fierce and dangerous."

And that was how Swar came to be the first human being who had a faithful dog to help him when he went out hunting.

## WHY THE SWALLOW BUILDS ON THE WALL

IN the days of long ago, when the first swallow skimmed lightly over moor and meadow, she was very proud of her pretty plumage and her long, forked tail. She flew low upon the water that she might see her own reflection upon its clear surface and at last, so occupied, became so vain that she could think of nothing but how best to show herself off before all her feathered friends. So it came about that in time she quite forgot how to build a nest.

After trying in vain for a time, she decided to ask help from some of the other birds. She went to the thrush, for she thought she looked the most good-natured, and asked her help.

"I will show you gladly," said the thrush. "First, you take some of these old grass stalks."

"Yes," said the swallow.

"Then take a lump of clay," went on the thrush, "to plaster them."

"Oh, yes, I know!" broke in the swallow.

"Plaster them exactly like this."

"Yes, I can do that all right."

"Then you turn it up like this."

"Oh, yes, I know!" again said the swallow.

"And then you——"

But before the thrush could add another word the swallow interrupted again.

"I know," she said; "of course."

This made the thrush angry.

"Well," she said, "if you know so much, why do you come bothering me with your questions?"

So saying, she flew away to look after her own nest and eggs.

Only half round the nest had been built, and the swallow, thus left to herself, could not make out how to finish it. She tried again and again, but all in vain. So she stuck the side she knew how to build on a wall, and made it do.

And thus it happens that the swallow, through thinking she knew more than she actually did know, has only half a nest to this day, as you can easily see.

## THE ROBBER AND THE MONK

A MONK who belonged to one of the monasteries near Paris used to travel from village to village in the neighborhood collecting money for the support of the monastery. One day, when he was returning home through a wood, a robber suddenly stepped in his path, and, presenting a pistol, demanded that the bag of money should be handed over.

The monk was of course unarmed and he at once saw that he would lose his life if he resisted, so he gave the robber the bag, asking only one favor in return.

"What is that?" said the man. "I never grant favors in the dark."

"Well," replied the monk, "when I get back to the monastery, I don't want my brethren to think I tamely gave up the bag of money without making a fight, so I am going to hold out my

cloak, and I want you to fire a bullet through it. Then it will be clear to my brethren that my life was really in peril."

The robber fired, but the monk could see no hole made by the bullet, and expressed astonishment.

"Ah!" laughed the robber. "That is not surprising, for I will tell you in confidence that I never load my pistols with bullets; I simply fire off gunpowder, and that is sufficient to make any traveler give up his money."

"Really!" answered the monk; and with that he sprang suddenly upon the robber, overcame him and bound him, and so recovered his money. Then he deprived the robber of his pistol, that he might not terrify any other travelers, and for the purpose of convincing the other monks of the perils of his journey.

## THE MAN WHO BROKE THE NEWS

THE son of a country landowner went to Paris to study at the University, and, after he had been there some time, he was astonished one morning to see an old manservant from his father's house.

"Why, what is the matter?" said the young man.

"The cat is dead," was the reply.

"The cat dead! Why, what did the poor animal die of?"

"Of indigestion, through having eaten too much meat."

"Too much meat! Where did the meat come from?"

"From your poor horses."

"The horses! Are they also dead, then?"

"Yes, the poor animals died from exhaustion, through having to carry so much water."

"What was the water for?"

"To put out the fire at the house."

"The fire at our house?"

"Yes, it caught fire because the maidservant forgot to put out the candles."

"What candles do you mean?"

"Why, the candles used at your father's funeral."

"My father's funeral! Do you mean to say my father is dead? Why did you not tell me at once?"

"Well, I was told to be sure to break the news to you as gently as possible."

## THE PAIR OF NEW BOOTS

A FRENCH soldier who was serving with his regiment in Algeria wrote home to his old father asking that a new pair of boots might be sent to him.

The father went to the village shoemaker's and bought a pair of strong boots, and then asked one of his acquaintances how to send them.

"You can telegraph them," said he.

"But that will cost a great deal of money," replied the old man.

"Oh, no," said the other, "it will cost you nothing. All you have to do is to take them out into the open country and hang them on the telegraph wire."

The old man decided to follow the advice, but hardly had he departed when a beggar, who had noticed the performance, went quietly, and, taking down the new boots, hung up his old and ragged ones in their place.

The father, feeling curious as to whether the boots had gone, went out of the village to see.

"Bless my soul," said he, "this telegraph is a wonderful thing. Here, for nothing, have I been able to send a pair of boots all the way to Algeria, while my son has been able in very little time to send his old ones back again to me."

## STORIES TOLD IN INDIA 3,000 YEARS AGO

### THE BLUE JACKAL

A JACKAL, prowling round a town one night, fell into an indigo-tank, and came out dyed blue.

"No one will know me now that I am this splendid color," said he, "so I will pretend that I am king of all the beasts."

He began by ruling over the jackals, and then the lions and the tigers submitted to him. This made him proud and insolent, and he no longer took any notice of his old jackal friends.

One night they gathered round the self-made king and began to howl, and as soon as the blue jackal heard the others yelling, his natural instinct led him to do the same, and at once all the other creatures in the jungle knew him to be nothing better than a jackal, and he lost for ever his crown.

*Silence is sometimes golden.*

### THE TRAVELER AND THE HERON

A WEARY traveler lay down to rest under the shadow of a fig-tree and went to sleep. In the tree lived a crow and a heron, and the heron had often been warned he would come to a bad end if he kept company with an evil crow.

As the sun shifted, so the shadow of the tree moved away from the traveler, and he was left exposed to the sun. But the heron, seeing this, felt sorry for him, and spread out his wings and shaded the weary traveler. The evil crow, however, laughed at the heron, and then, to annoy the traveler, dropped a stone upon his face and flew away.

When the traveler, smarting from the sting of the stone, jumped up and seized his bow and arrow, he saw only the heron in the tree above, and, thinking that this was the culprit who had thrown the stone, he fitted an arrow to the string, and fired and killed the heron.

*Avoid evil companions or they may lead you into serious trouble.*

### THE CROWS AND THE ANKLET

A PAIR of crows lived in a hollow tree, and there also lived in the bottom of this tree a fierce snake that used to eat the young of the crows as soon as they were hatched.

One day when the son of the king

came down to the river close by to bathe, the male crow flew down, and, seizing a golden anklet that the prince had removed and laid on the bank, he flew away with it and dropped it inside the hollow tree.

Of course, as soon as the king's son came to the bank again after bathing to put on his clothes, he noticed the anklet was missing. There was a great hue and cry, and every place was searched for the missing jewelry. At last the anklet was found in the hollow tree, and the serpent was also found by the prince's attendants, who instantly killed it.

*Skill will make up for lack of strength.*

### THE ELEPHANTS AND THE MOON

IN a time of drought a number of elephants had difficulty in finding water for themselves. But at last they discovered a pool, near which lived a colony of hares, and in going to and fro the elephants used to trample upon several hares every day. At last the matter became so serious that a meeting of the hares was held, and, after a good deal of discussion, an old hare, known for his wisdom, undertook to make the elephants cease using the pool.

Standing erect upon a hillock, as the sun went down, the little old grey hare listened for the crashing in the jungle which would tell him that the great beasts were coming down for their evening drink. When the sound reached his ear he stiffened his thin form, though his heart beat violently, and as the leader of the elephants approached, the hare said:

"Sir, I am an ambassador from the moon, who wishes you to know that this is his pool, and that the hares whom you are driving away are its guardians."

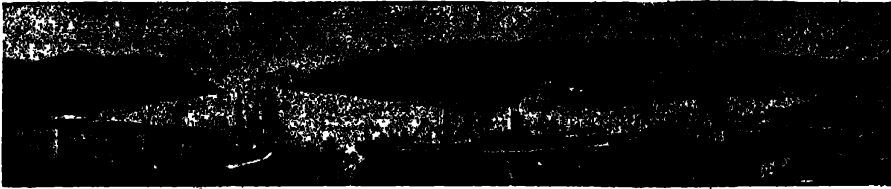
"We know nothing of this," said the elephant.

"Well, if you come here to-night, you will see the moon in the pool, shaking with rage."

The elephant went. He saw the reflection of the moon, which quaked as the water rippled, and in great fear he promised that the elephants should trespass on the pool no more.

*Superstition often causes those who are mighty to tremble.*

CONTINUED ON PAGE 6339.



The beautiful harbor of St. John's, the capital of Newfoundland.

## THE DOMINION OF NEWFOUNDLAND WHERE THE CODFISH REIGNS

**NEWFOUND-** LAND, the first born English colony in America, is an island at the mouth of the Gulf of St. Lawrence, which it protects from the full sweep of the Atlantic Ocean. It is not part of Canada, but as it is part of the British Empire, and lies so close to Canada, we tell its story here. The island, roughly triangular in shape, with its area of 42,734 square miles, is one-third larger than Ireland. The coasts are everywhere bold and rugged, presenting a high line of broken cliffs, indented with numerous bays and studded with countless islands.

### THE BEOTHUKS, THE EARLIEST INHABITANTS OF NEWFOUNDLAND

The earliest known inhabitants were the Beothuks, a numerous and powerful race, who may have been related to the North American Indian. When John Cabot discovered the island in 1497, these people were at the height of their prosperity. The doom of the natives was sealed with the coming of the white man. The struggle which was waged in the mainland between white man and Indian was also carried on in Newfoundland. The destruction was so complete that all we have left are a few skulls, a skeleton, some bones, and a collection of implements in a museum at St. John's.

### THE PEOPLE OF THE ISLAND ARE NATIVE BORN

The population of the island is 247,710, of which one-third is engaged in fishing. The majority of the people live along the southeastern coast. There are few settlers in the interior and the French claims were a check to

CONTINUED FROM 6126

settlement on the west shores. The inhabitants are chiefly native born descendants of Irish, English and Scotch ancestors.

The chief occupation of the people is cod fishing. In many villages dried cod serve as money, with which people buy food, clothing and fishing tackle. There are three distinct branches of the industry, the Banks, the Shore and the Labrador fisheries. The Banks lie southward of the island, about thirty miles distant from the nearest land, and cover a great area. To these fishing grounds, which are huge submarine islands, which rise nearly to the surface of the water, the fishermen of France, Canada, the United States and the island go during the fishing season. The grounds are on the "high seas" and therefore subject to the jurisdiction of no country or nation. Schooners carrying from twelve to twenty men sail from the mainland and anchor. The crews go out from the schooners in pairs in flat-bottomed boats called dories. They fish with trawls, which are long lines supported at each end, and from which many short lines with baited hooks hang. Oftentimes a passenger on an ocean steamer is surprised as the fog lifts to see scores of small dories, anchored apparently in mid-ocean. Fogs and storms annually cause the death of many of these brave and hardy fishermen.

### IMPORTANCE OF THE COAST FISHERIES TO THE ISLAND

Bank fishing is not of very great importance to Newfoundland. By far the greater number of the fishermen are engaged in coast fishing.

Shore fishing is carried on from punts or skiffs. Those fishing from punts use ordinary hooks and lines. The fishermen with skiffs use traps. A trap is an enclosure of netting sunk in the sea and so arranged that the schools of cod in swimming by will blunder into it and become ensnared. The coast fishing is not so good as it was a few years ago. Thousands of fishermen, taking with them their wives and children, leave their homes every June and sail to the fishing grounds off the coast of Labrador. Some live in turf huts or timber shacks along the coast, while others live on the schooners. The women and children assist in curing the fish. They fish until October, when they return home with their catch.

#### THE FISHERMAN AT HOME IN HIS VILLAGE

A number of little, square, white-washed, one story cottages nestling in the cliffs overlooking a bay or a cove is a typical fishing village. A score or more goats scamper among the neighboring rocks, as each household has one or more of these animals. Out into the water of the little harbor are built the stages at which the men land their fish. The cod are scaled by the men as they are caught, but the "splitting," "heading" and "salting" is generally done on shore by the women and children. After salting, the fish are taken to the "flakes"—rude scaffolds covered with under-brush—and there spread out to dry.

The hardy, sturdy fisherman lives, as a rule, from hand to mouth. The season's catch is usually mortgaged to the village merchant or "planter," who in turn loans sufficient to carry the poor fisherman through until the following October. This process continues from year to year. The boys are reared on the water and at six can manage a sail. After the fishing season closes in October, the men do little besides mend their nets and fishing tackle. They love to tell stories of their adventurous life and eagerly wait for the season to open in March. The Newfoundland fisherman, inhabiting more than a hundred such villages, is a hardy, burly, uncouth, warm-hearted, hospitable fellow, a blend of English, Irish and Scotch blood.

#### WHY COD ARE SO PLENTIFUL ABOUT THE ISLAND

The reason why the world's greatest cod fishing ground is centred at this island

is interesting. The Arctic current which flows past Newfoundland carries with it hundreds of thousands of tons of minute living matter upon which the small shell-fish and other creatures of the sea feed. In turn, these become the food of vast schools of cod. It is strange but true that the Arctic seas and rivers, in spite of the great cold with which they are surrounded, contribute most abundantly to this supply of living slime. Unless this flood from the Pole is stopped, the fishermen cannot lessen very much the supply of cod. Uncountable millions of cod will continue to come from the darker recesses of their unknown deep-sea homes and throng the Banks and shallower waters where conditions are suitable for breeding and where an abundant supply of food is found.

#### COD-LIVER OIL AND OTHER THINGS

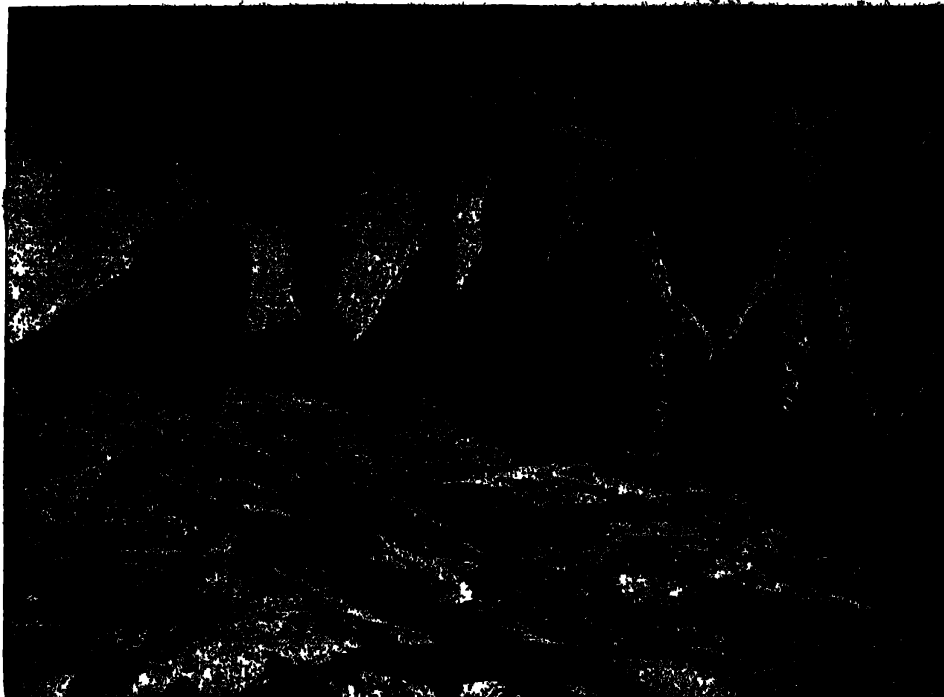
All parts of the fish are used. Cod-liver oil is extracted from the livers. Glue is made from the skins while the heads and entrails are used for the manufacture of fertilizers. Great swarms of herring arrive along the coast during the early part of September. Large quantities are used as bait for cod, and packing herrings for food is fast becoming an important industry. Several lobster canneries are doing a thriving business along the southern coast. The sealing industry is not so important and profitable as it was and the open season for seal fishing now lasts only one month in the year, from the middle of March to the middle of April. If this restriction had not been made, the seals would have been killed off.

The Newfoundland dog, of which you have all heard, has almost died out on the island. It is supposed to have developed from a cross between the sledge dogs, which are closely related to the wolf, and other dogs brought from Europe.

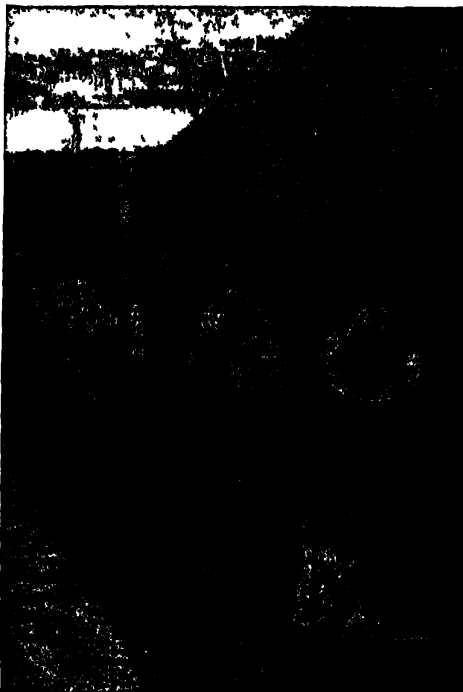
#### MINERALS AND FORESTS IN THE ISLAND DOMINION

The early history of Newfoundland is filled with the story of struggles between the English and the French, for both nations claimed the island. It was ceded to Great Britain by the Treaty of Utrecht; but the treaty provided that the French were to have the same rights of fishing on the western shore as the English, and that neither nation was to make a permanent settlement on that shore.

## CATCHING AND CURING GODFISH



Newfoundland may be said to live from the sea. The fisheries here are very important, and the chief subject of conversation is the size of the catch. These fish will soon be split open and spread to dry on the platform you see below. Later they will be packed and sold. The fishermen are very fine sailors.



The fish shown in the picture above have been split open and are here being rubbed by the fishermen with a salt mixture to preserve them. After this has been done and the salt has well soaked in, they are spread out in the sun to dry, as shown in the picture on the right. The racks upon which the fish are drying are called "flakes." The fish look like thick fleshy leaves as they lie in piles.

This provision led to serious troubles between Great Britain and France later on, and it was not until 1904 that the question was finally disposed of.

The early settlements were made in defiance of the rules laid down by the merchants who provided capital for the fishing. These merchants or "venturers," as they were called in the beginning, wished to keep the island as a fishing station merely, and contrived to have laws made which forbade permanent settlements within six miles of the shore. Men employed in the fisheries were forbidden to bring their families to the island, to live there during the winter, or to build themselves more than a rough shelter for the season. Families did find their way there and settlements were made; but the settlers were all fishermen, and fishermen for the most part they have remained. The men who were ready to brave any danger on the deep, made small effort to explore the land or to cultivate the narrow shore line that they knew. The villages and settlements were scattered, and there was much isolation and poverty. The fishermen are very brave, and are fine sailors, and many of them find their way into the British navy. Their heroism in the Great War has been noted even among the many heroic deeds of that dreadful time.

With the building of roads and railways, however, a new era was begun. The island was explored, and it was found that the interior is not, as was supposed, a desert. On the contrary, Newfoundland is a treasure house of minerals. There is scarcely a man who cannot show you on his mantel-shelf a specimen of the copper, iron, nickel and even gold ore of his neighborhood. Several thousand tons of copper and iron are produced yearly, but the industry is only in its infancy. Various mines of coal, asbestos, nickel, lead, and gold in different parts of the island are in various stages of development, and give promise of becoming properties of great value. Along the coasts and in the interior are large tracts of heavily-timbered land. Lumbering operations are extending rapidly. Large pulp mills have been built, and a great deal of pulp for the making of paper is exported, chiefly to England.

Farming has not been followed to any extent. Out of a large area of over five million acres of tillable land only one

hundred thousand are under cultivation. The people do not care to work in factories and are not adapted to such employment. Nevertheless interest in farming is increasing, and the pulp mills have already brought greater prosperity to the island.

St. John's (32,292), the capital of the island, is on the southeast coast and is situated on one of the finest natural harbors in America. The city is entirely devoted to the fishing business. Harbor Grace (8,000), Carbonear (4,500), and Bonavista are the only other towns of importance.

#### THE GOVERNMENT OF THE ISLAND

The island did not join the Dominion of Canada, and the British Government still appoints the Governor. There are two chambers, the legislative council of fifteen members, appointed for life by the government of the day, and the legislative assembly, consisting of thirty-six members, elected for four years by ballot under manhood suffrage. The executive government is a ministry responsible to the legislature and holding office so long as they command a majority in the assembly. Newfoundland was made a Dominion in the year 1918 in recognition of the help given to the empire in the Great War.

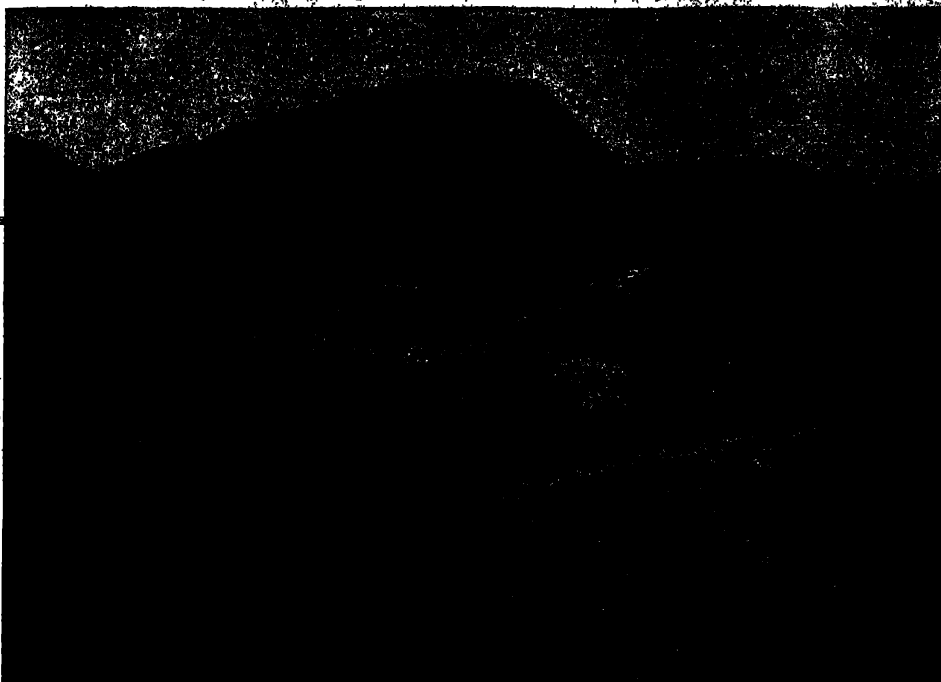
The government of Newfoundland also controls the coast of Labrador, that strange, desolate, thinly-populated country which deserves a whole article itself. Perhaps you have heard of the work of the medical missionary, Doctor Wilfred Grenfell, who is devoting his life to the improvement of the lot of the fishermen there.

The possession of so many useful minerals, such vast tracts of forests, such large areas of fertile plains makes Newfoundland a country most favorably equipped for mining, lumbering, agriculture and manufacturing. With capital, enterprise and labor the island is destined to become a great producing and exporting country.

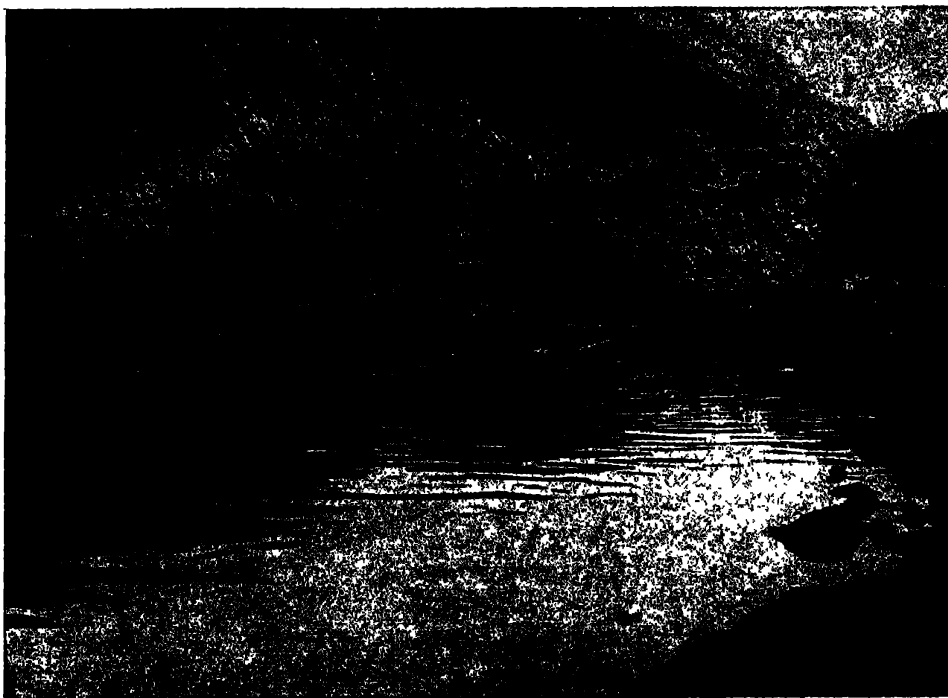
Newfoundland, as we have read in other parts of the book, has played a great part in the history of wireless telegraphy. It was on a high cliff near St. John's that Marconi set up the first instrument that caught a message, through the air, across the ocean.

THE NEXT STORY OF CANADA IS ON PAGE 6345.

## WHERE THE SEA GIVES A LIVELIHOOD



Near St. John's is the quaint little village of Quidi Vidi, where one can see every process in curing and packing fish. Notice the platform upon which the fish are spread to dry, and the towering hills around the little harbor. Every village has its fish platforms, called "flakes." There are few factories to provide work in the towns and the people continue to live in their seaside homes. Some now live on farms.



This is a picture of the rocky, winding entrance to the quaint little harbor of Quidi Vidi, which is shown above. The men have been out for a hard day's fishing along the coast and are now coming back with loaded boats at evening time for a well-earned rest. The picture gives a good idea of the rugged coast of the island dominion, which was the first English colony in the New World.



## THE DESERTED PALACE OF PEACE AT THE HAGUE



Soon after the first Conference to discuss the possibility of putting an end to war, which met at The Hague, the capital of the Netherlands, in 1899, Andrew Carnegie announced that he would build a permanent home for the Conference and the Court of Arbitration appointed to sit there. The building was completed at the cost of more than \$1,500,000, but the Court has not had the desired effect. The greatest war in history broke out after the completion of the building.

# The Book of POETRY

## A GREAT HISTORICAL POEM

ONE of the best known poems of Thomas Gray, the English poet, is "The Bard," which he finished in 1757. The Bard is an old Welsh minstrel who halts Edward I of England, conqueror of Wales (Cambria), to terrify him by foretelling the fate of English kings. After lamenting over fallen Welsh kings and bards (stanzas 2 and 3), the singer predicts the death of Edward II at Berkeley Castle, and the wars with France under Edward III (4); the death of Edward III and his son, the Black Prince (5); Richard II; the Wars of the Roses; the murders in the Tower of Henry VI and the little princes; the fall of Richard III ("the bristled Boar"); the marriage of Henry VII (Lancaster) with Elizabeth of York (6); the glory of England under the Tudors, who were of Welsh descent, especially of Queen Elizabeth's reign, with the poetry of Shakespeare and Milton (7, 8 and 9).

## THE BARD

"RUIN seize thee,  
ruthless King!  
Confusion on thy banners  
wait;

Tho' fanned by Conquest's crimson  
wing,

They mock the air with idle state.  
Helm, nor hauberk's twisted mail,  
Nor e'en thy virtues, Tyrant, shall  
avail

To save thy secret soul from nightly  
fears,

From Cambria's curse, from Cambria's  
tears!"

Such were the sounds that o'er the crested  
pride

Of the first Edward scattered wild dis-  
may,

As down the steep of Snowdon's shaggy  
side

He wound with toilsome march his long  
array.

Stout Glo'ster stood aghast in speechless  
trance:

"To arms!" cried Mortimer, and couched  
his quivering lance.

On a rock, whose haughty brow  
Frowns o'er cold Conway's foaming flood,

Robed in the sable garb of woe,  
With haggard eyes the poet stood;

(Loose his beard, and hoary hair  
Streamed, like a meteor, to the troubled  
air);

And with a master's hand, and prophet's  
fire,

Struck the deep sorrows of his lyre.

"Hark, how each giant-oak, and desert  
cave,

Sighs to the torrent's awful voice beneath!  
O'er thee, oh King! their hundred arms  
they wave,

Revenge on thee in hoarser murmurs  
breathe;

Vocal no more, since Cambria's fatal day,  
To high-born Hoel's harp, or soft  
Llewellyn's lay.

CONTINUED FROM 6089



"Cold is Cadwallo's  
tongue,  
That hushed the stormy  
main:

Brave Urien sleeps upon his craggy  
bed:

Mountains, ye mourn in vain  
Modred, whose magic song  
Made huge Plinlimmon bow his  
cloud-topped head.

On dreary Arvon's shore they lie,  
Smeared with gore, and ghastly pale:  
Far, far aloof th' affrighted ravens sail;  
The famished eagle screams, and passes  
by.

Dear lost companions of my tuneful art,  
Dear as the light that visits these sad  
eyes,

Dear as the ruddy drops that warm my  
heart,

Ye died amidst your dying country's  
cries--

No more I weep. They do not sleep.

On yonder cliffs, a grisly band,

I see them sit, they linger yet,

Avengers of their native land:

With me in dreadful harmony they join,  
And weave with bloody hands the tissue  
of thy line.

"Weave the warp, and weave the woof,  
The winding sheet of Edward's race.

Give ample room, and verge enough

The characters of hell to trace.

Mark the year, and mark the night,

When Severn shall re-echo with affright

The shrieks of death, thro' Berkeley's

roof that ring,

Shrieks of an agonizing king!

She-wolf of France, with unrelenting

fangs,

That tear't the bowels of thy mangled

mate,

From thee be born, who o'er thy coun-  
try hangs

The scourge of heaven. What terrors  
round him wait!

Amazement in his van, with flight combined,  
And sorrow's faded form, and solitude behind.

"Mighty victor, mighty lord!  
Low on his funeral couch he lies!  
No pitying heart, no eye, afford  
A tear to grace his obsequies.  
Is the sable warrior fled?  
Thy son is gone. He rests among the dead.  
The swarm, that in thy noontide beam were  
born?

Gone to salute the rising morn.  
Fair laughs the morn, and soft the zephyr  
blows,

While proudly riding o'er the azure realm  
In gallant trim the gilded vessel goes;

Youth on the prow, and Pleasure at the  
helm;  
Regardless of the sweeping whirlwind's  
sway,  
That, hushed in grim repose, expects his evening  
prey.

"Fill high the sparkling bowl,  
The rich repast prepare;  
Reft of a crown, he yet may share the  
feast:

Close by the regal chair  
Fell Thirst and Famine scowl  
A baleful smile upon their baffled guest.  
Heard ye the din of battle bray,  
Lance to lance, and horse to horse?  
Long years of havoc urge their destined  
course,

And thro' the kindred squallorons mow their  
way.

Ye towers of Julius, London's lasting  
shame,  
With many a foul and midnight murder fed,  
Revere his consort's faith, his father's  
fame,

And spare the meek usurper's holy head.  
Above, below, the rose of snow,  
Twined with her blushing foe, we spread:  
The bristled boar in infant-gore  
Wallows beneath the thorny shade.

Now, brothers, bending o'er the accursed  
loom,  
Stamp we our vengeance deep, and ratify  
his doom.

"Edward, lo! to sudden fate  
(Weave we the woof. The thread is spun.)  
Half of thy heart we consecrate.  
(The web is wove. The work is done.)  
Stay, oh stay! nor thus forlorn  
Leave me unblest, unpitied, here to mourn;  
In yon bright track, that fires the western  
skies,  
They melt, they vanish from my eyes.  
But oh! what solemn scenes on Snowdon's  
height

Descending slow their glittering skirts un-  
roll?

Visions of glory, spare my aching sight!  
Ye unborn ages, crowd not on my soul!  
No more our long-lost Arthur we bewail.  
All hail, ye genuine kings, Britannia's issue,  
hail!

"Girt with many a baron bold  
Sublime their starry fronts they rear;  
And gorgeous dames, and statesmen old  
And bearded majesty, appear.  
In the midst a form divine!  
Her eye proclaims her of the Briton-line;  
Her lion-port, her awe-commanding face,  
Attempered sweet to virgin-grace.  
What strings symphonious tremble in the air,  
What strains of vocal transport round her  
play!

Hear from the grave, great Taliessin, hear;  
They breathe a soul to animate thy clay.  
Bright Rapture calls, and soaring as she  
sings,  
Waves in the eye of heaven her many-  
colored wings.

"The verse adorn again  
Fierce war, and faithful love,  
And truth severe, by fairy fiction drest.  
In buskined measures move  
Pale grief, and pleasing pain,  
With horror, tyrant of the throbbing breast.

A voice, as of the cherub-choir,  
Gales from blooming Eden bear;  
And distant warblings lessen on my ear,  
That lost in long futurity expire.

Fond impious man, think'st thou yon san-  
guine cloud,  
Raised by thy breath, has quenched the  
orb of day?

To-morrow he repairs the golden flood,  
And warms the nations with redoubled  
ray.

Enough for me; with joy I see  
The different doom our fates assign.  
Be thine despair, and sceptred care,  
To triumph, and to die, are mine."  
He spoke, and headlong from the mountain's  
height  
Deep in the roaring tide he plunged to end-  
less night.

### O WERT THOU IN THE CAULD BLAST

There is no poetry in the English language so simple  
in the choice of subjects, so natural in expression,  
so touching in sentiment, as the poetry of Robert  
Burns, "the ploughman of Ayrshire." The field-  
mouse, the daisy, the lassie he loves, he sings about  
so sweetly that it almost moves to tears. Although  
he has written a number of long poems, like "Tam  
O'Shanter" and "The Cotter's Saturday Night,"  
found on page 4063, it is his lyrics like this little  
poem which have endeared him to all hearts.

O, WERT thou in the cauld blast,  
On yonder lea, on yonder lea;  
My plaidie to the angry airt,  
I'd shelter thee, I'd shelter thee;  
Or did misfortune's bitter storms  
Around thee blow, around thee blow,  
Thy bield should be my bosom,  
To share it a', to share it a'.

Or were I in the wildest waste,  
Sae black and bare, sae black and bare,  
The desert were a paradise,  
If thou wert there, if thou wert there.  
Or were I monarch o' the globe,  
Wi' thee to reign, wi' thee to reign,  
The brightest jewel in my crown  
Wad be my queen, wad be my queen.

THE BELL OF ATRI

Longfellow is pre-eminent among modern poets in his gift of narrative poetry, or the art of telling again in timely verse some old, old story. In the following he gives us, with admirable art and sympathy, an old legend of an Italian town. The story is told so simply that scarcely any detail requires explanation, but it will help the young readers to know that "Giovanni" is the Italian for John, and "Re" for King.

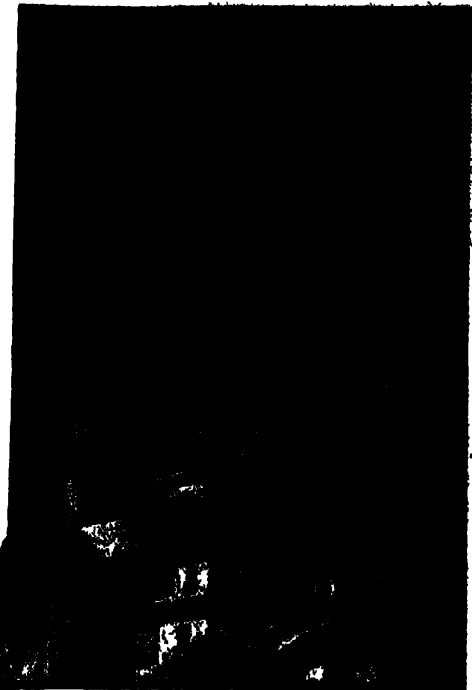
AT Atri, in Abruzzo, a small town  
Of ancient Roman date, but scant renown,  
One of those little places that have run  
Half up the hill, beneath a blazing sun,  
And then sat down to rest, as if to say,  
"I climb no farther upward, come what may"  
The Re Giovanni now unknown to fame,  
So many monarchs since have borne the name,  
Had a great bell hung in the market-place  
Beneath a roof projecting some small space,  
By way of shelter from the sun and rain  
Then rode he through the streets with all his  
train

And, with a blast of trumpets loud and long,  
Made proclamation, that whenever wrong  
Was done to any man, he should but ring  
The great bell in the square, and he the King  
Would cause the Syndic to decide thereon  
Such was the proclamation of King John

How swift the happy days in Atri sped,  
What wrongs were righted need not here be said.  
Suffice it that, as all things must decay,  
The hempen rope at length was worn away,  
Unraveled at the end, and, strand by strand  
Loosened and wisted in the ringier's hand,  
Till one who noted this in passing by,  
Mended the rope with braids of briony  
So that the leaves and tendrils of the vine  
Hung like a votive garland at a shrine



By chance it happened that in Atri dwelt  
A knight, with spur on heel and sword in belt,  
Who loved to hunt the wild boar in the woods,  
Who loved his falcons with their crimson hoods,  
Who loved his hounds and horses, and all sports,  
And prodigalities of camps and courts;  
Loved, or had loved them; for at last, grown  
old,  
His only passion was the love of gold.



He sold his horses, sold his hawks and hounds,  
Rented his vineyards and his garden grounds,  
Kept on one steed, his favorite steed of all,  
To starve and shiver in a naked stall,  
And day by day sat brooding in his chair,  
Devising plans how best to hoard and spare.

At length he said: "What is the use or need  
To keep at my own cost this lazy steed,  
Laying his head off in my stables here,  
When rents are low and provender is dear?  
Let him go feed upon the public ways;  
I want him only for the holidays"  
So the old steed was turned into the heat  
Of the long, lonely, silent, shadeless street;  
And wandered in suburban lanes forlorn,  
Barked at by dogs, and torn by briar and thorn.

One afternoon, as in that sultry clime  
It is the custom in the summer-time,  
With the bolted doors and window-shutters  
closed,  
The inhabitants of Atri slept or dozed;  
When suddenly upon their senses fell  
The loud alarm of the accusing bell!  
The Syndic started from his deep repose,  
Turned on his couch, and listened, and then  
rose  
And donned his robes, and with reluctant pace  
Went panting forth into the market-place.

Where the great bell upon its crossbeam  
swung,  
Reiterating with persistent tongue,  
In half-articulate jargon, the old song:  
"Someone hath done a wrong, hath done a  
wrong!"

But ere he reached the belfry's light arcade  
He saw, he thought, beneath its shade,  
No shape of human form of woman born,  
But a poor steed, dejected and forlorn,  
Who, with uplifted head and eager eye,  
Was tugging at the vines of briony.  
"Domeneddio!" cried the Syndic straight,  
"This is the Knight of Atri's steed of state!  
He calls for justice, being sore distressed,  
And pleads his cause as loudly as the best."

Meanwhile from street and lane a noisy  
crowd  
Had rolled together like a summer cloud,  
And told the story of the wretched beast  
In five-and-twenty different ways at least,  
With much gesticulation and appeal  
To heathen gods, in their excessive zeal.

The knight was called and questioned; in  
reply  
Did not confess the fact, did not deny;  
Treated the matter as a pleasant jest,  
And set at naught the Syndic and the rest,  
Maintaining, in an angry undertone,  
That he should do what pleased him with  
his own.

And thereupon the Syndic gravely read  
The proclamation of the King; then said:  
"Pride goeth forth on horseback grand and  
gay,  
But cometh back on foot, and begs its  
way;  
Fame is the fragrance of heroic deeds,  
Of flowers of chivalry and not of weeds!  
These are familiar proverbs, but I fear  
They never yet have reached your knightly  
ear.  
What fair renown, what honor, what re-  
pute  
Can come to you from starving this poor  
brute?  
He who serves well and speaks not, merits  
more  
Than they who clamor loudest at the door.  
Therefore the law decrees that as this steed  
Served you in youth, henceforth you shall  
take heed  
To comfort his old age, and to provide  
Shelter in stall, and food and field beside."

The knight withdrew, abashed; the people all  
Led home the steed in triumph to his stall.  
The King heard and approved, and laughed  
in glee,  
And cried aloud: "Right well it pleaseth  
me!  
Church-bells at best but ring us to the door,  
But go not in to Mass; my bell doth more:  
It cometh into court and pleads the cause  
Of creatures dumb and unknown to the  
laws;  
And this shall make, in every Christian  
clime,  
The bell of Atri famous for all time."

## THE MILLER OF THE DEE

Charles Mackay's songs always breathe a genial spirit, and this is one of the heartiest. The joy of inward health and gay content is caroled so naturally by the happy miller that he is envied by a passing king. Notice how well a story may be told in easy words. Out of 202 words in these verses 177 are of one syllable, and only one—"nobody"—has three.

THERE dwelt a miller hale and bold  
Beside the River Dee;  
He wrought and sang from morn to night,  
No lark more blithe than he;  
And this the burden of his song  
For ever used to be—  
"I envy nobody, no, not I,  
And nobody envies me!"  
"Thou'rt wrong, my friend!" said old King  
Hal,  
"Thou'rt wrong as wrong can be;  
For could my heart be light as thine  
I'd gladly change with thee.  
And tell me now what makes thee sing  
With voice so loud and free,  
While I am sad, though I'm the king,  
Beside the River Dee?"

The miller smiled and doffed his cap:  
"I earn my bread," quoth he;  
"I love my wife, I love my friends,  
I love my children three;  
I owe no penny I cannot pay;  
I thank the River Dee,  
That turns the mill and grinds the corn,  
To feed my babes and me."

"Good friend!" said Hal, and sighed the  
while,  
"Farewell, and happy be;  
But say no more, if thou'dst be true,  
That no one envies thee.  
Thy mealy cap is worth my crown,  
Thy mill my kingdom's fee!  
Such men as thou are England's boast,  
O miller of the Dee!"

## I SAW A NEW WORLD

In this poem, W. B. Rands shows what a mess might be made of the world if it were to be fixed without change, and how interesting it is with all its surprises and strife and hope and dreams.

I SAW a new world in my dream,  
Where all the folks alike did seem;  
There was no Child, there was no Mother,—  
There was no Change, there was no Other.

For everything was Same, the Same;  
There was no Praise, there was no Blame;  
There was neither Need nor Help for it;  
There was nothing fitting, or unfit.

Nobody laughed, nobody wept;  
None grew weary, so none slept;  
There was nobody born, and nobody wed;  
This world was a world of the living dead.

I longed to hear the Time-Clock strike  
In the world where the people were all alike;  
I hated Same, I hated Forever,  
I longed to say Neither, or even Never.

I longed to mend, I longed to make,  
I longed to give, I longed to take,  
I longed for a change, whatever came after,  
I longed for crying, I longed for laughter.

### THE WILD ROSE

The following is one of the most widely known of Goethe's lyrics. The encounter between the selfish boy and the delicate rose, who has only her thorns to protect her, is delightfully portrayed. Franz Schubert composed the music for this pretty lyric.

A BOY espied, in morning light,  
A little rosebud blowing;  
'Twas so delicate and bright  
That he came to feast his sight,  
And wonder at its growing.  
Rosebud, rosebud, rosebud red,  
Rosebud brightly blooming.

"I will gather thee,"—he cried,—  
"Rosebud brightly glowing!"  
"Then I'll sting thee," it replied,  
"And you'll quickly start aside  
With the prickle glowing."  
Rosebud, rosebud, rosebud red,  
Rosebud brightly blooming.

But he plucked it from the plain,  
The rosebud brightly blowing!  
It turned and stung him, but in vain—  
He regarded not the pain,  
Homeward with it going.  
Rosebud, rosebud, rosebud red,  
Rosebud brightly blooming.

### THE MOSS ROSE

This little poem is by Krummacker, who is classed with William Cullen Bryant as a nature poet. He is especially noted for his poems about the Alps.

THE Angel of the flowers, one day,  
Beneath a rose tree sleeping lay,—  
That spirit to whose charge 'tis given  
To bathe young buds in dew of heaven.  
Awakening from his light repose,  
The Angel whispered to the rose:  
"O fondest object of my care,  
Still fairest found, where all are fair,  
For the sweet shade thou giv'st to me  
Ask what thou wilt, 'tis granted thee."  
"Then," said the rose with deepened glow,  
"On me another grace bestow."  
The spirit paused in silent thought,—  
What grace was there that flower had not?  
'Twas but a moment, o'er the rose  
A veil of moss the Angel throws,  
And, robed in nature's simplest weed,  
Could there a flower that rose excel!

### THE PRETTY FISHER MAIDEN

Heinrich Heine wrote this song, for which Franz Schubert wrote the music. It is one of the best known German lyrics which have made him popular.

COME, fairest fisher maiden, here  
Put, put thy skiff to land;  
Come close to me and sit thee down,  
And prattle hand in hand.

Oh, lay thy head upon my heart,  
Have not such fear of me,  
Thou trustest day by day thyself  
Unto the wild, wild sea.

My heart is like the sea, it hath  
Its storm, and ebb and flow;  
And many pretty pearls, my love,  
Rest in its depth below.

### WHITHER?

Wilhelm Müller, just as Heine, implies that all water is inhabited by some fairy or water nymph. It is a fanciful idea to suggest that instead of the noise caused by the water flowing over the rocks and pebbles, the nymphs are singing their alluring songs.

I HEARD a brooklet gushing  
From its rocky fountain near,  
Down into the valley rushing,  
So fresh and wondrous clear.

I know not what came o'er me,  
Nor who the counsel gave;  
But I must hasten downward,  
All with my pilgrim stave;

Downward and ever farther  
And ever the brook beside,  
And ever fresher murmured  
And ever clearer the tide.

Is this the way I was going?  
Whither, O brooklet, say!  
Thou hast, with thy soft murmur,  
Murmured my senses away.

What do I say of a murmur?  
That can no murmur be;  
'Tis the water-nymphs, that are singing  
Their roundelays unto me.

Let them sing, my friend, let them murmur,  
And wander merrily near;  
The wheels of a mill are going  
In every brooklet clear.

### TO MY SISTER

"To My Sister" was written by Heine, when, as a middle-aged man, he visited the house in which he was born. This is a splendid example of the poet's delightful simplicity of style. Heinrich Heine, as many other poets, vividly recalls his childhood days.

MY child, when we were children,  
Two children small and gay,  
Who would creep into the hen-house,  
And hide us in the hay,

We cackled like the young cockerels  
And to everybody going,  
"Cock-a-doodle-doo!"—we cried;  
And they thought the cocks were crowing.

We spread old bits of carpet  
On some chests within the court;  
And there we lived together  
In a house of the finest sort.

An old cat of our neighbors  
Often came to make a call;  
We made her bows and courtesies  
And compliments and all.

We made very kind inquiries  
About the health of our old friend;  
Since then we have had to put the same  
To old cats without end.

We used to sit conversing  
In a solemn, elderly way,  
Complaining, how much better  
Things had been in our day;

How Love, Truth, and Religion  
One hardly ever met;  
How coffee had grown very dear  
And money hard to get.

They all are gone—the little games  
We played at in our youth,  
And money, and the good old times  
And Religion, Love and Truth.

### THE CASTLE BY THE SEA

This poem is by Uhland, and at the time in which he lived Germany was divided into many small principalities. These were constantly at war with one another. The castle so beautifully described is Germany trying to stand against the tyranny of the government. The daughter is Freedom, who no longer lives with her parents in the lordly castle by the sea.

HAST thou seen that lordly castle,  
That castle by the sea!  
Golden and red above it  
The clouds float gorgeously.

And fain it would stoop downward  
To the mirrored waves below;  
And fain it would soar upward  
In the evening's crimson glow.

Well have I seen that castle,  
That castle by the sea,  
And the moon above it standing,  
And the mist rise solemnly.

The winds and waves of ocean,  
Had they a merry chime?  
Didst thou hear, from those lofty chambers  
The harp and the minstrels rhyme?

The winds and the waves of ocean,  
They rested quietly;  
But I heard on the gale a sound of wail,  
And tears came to mine eyes.

And sawest thou on the turrets  
The King and his royal bride,  
And the wave of their crimson mantles,  
And the golden crown of pride?

Led they not forth in rapture  
A beauteous maiden there,  
Resplendent as the morning sun,  
Beaming with golden hair?

Well, I saw the ancient parents,  
Without the crown of pride.  
They were moving slow in weeds of woe,  
No maiden was by their side.

### REST

These thoughts in verse are from the great German poet Goethe—the greatest of all German poets and writers, and one of the giants of European literature. He lived between 1749 and 1832. These six lines are worth careful study as an instance of compression of thought. Nine thoughts are expressed in less than fifty words in this fine little poem.

REST is not quitting the busy career;  
Rest is the fitting of self to one's sphere.

'Tis the brook's motion clear without strife;  
Fleeting to ocean after its life.

'Tis loving and serving the highest and best;  
'Tis onward, unswerving, and this is true rest.

### THE ERL KING

Goethe tells the story of a father bringing home his sick child, who, in his delirium, believes that the branches of the trees are the Erl king and his daughters trying to seize him. The Erl king, according to German legends, is the spirit which dwells in the willow tree. The poem has been set to music by Franz Schubert as well as many other lyrics.

WHO rides there so late through the  
night—dark and drear?

The father it is, with his infant so dear,  
He holdeth the boy tightly clasped in his arm.

He holdeth him safely, he keepeth him warm.

"My son, wherefore seek'st thou thy face  
thus to hide?"

"Look, father, the Erl king is close to our  
side!

Dost thou see not the Erl king with crown  
and with train?"

"My son, 'tis the mist rising over the plain."

"Oh, come, thou dear infant—oh, come thou  
with me!

Full many a game, I will play there with  
thee;

On my strand, lovely flowers their blossoms  
unfold.

My mother shall grace thee with garments  
of gold."

"My father, my father, and dost thou not  
hear

The words that the Erl king now breathes  
in mine ear?"

"Be calm, dearest child, 'tis thy fancy de-  
ceives;

'Tis the sad wind that sighs through the  
withering leaves."

"Wilt go then, dear infant, wilt go with  
me there?

My daughters shall tend thee with sisterly  
care,

My daughters by night their glad festival  
keep,

They'll dance thee, and rock thee and sing  
thee to sleep."

"My father, my father, and dost thou not  
see,

How the Erl king, his daughters has 'rought  
here for me?"

"My darling, my darling, I see it aright,  
'Tis the aged gray willows deceiving thy  
sight."

"I love thee, I'm charm'd by thy beauty,  
dear boy!

And if thou'rt unwilling, then force I'll em-  
ploy."

"My father, my father, he seizes me fast.  
Full sorely the Erl king has hurt me at last."

The father now gallops, with terror, half  
wild,

He grasps in his arms the poor shuddering  
child,

He reaches his courtyard with toil and with  
dread,

The child in his arms finds he motionless,  
dead.

## LITTLE VERSES FOR VERY LITTLE PEOPLE

## RHYMES AND JINGLES AND THEIR USE

**W**HAT is the use of Nursery Rhymes? Did any boy or girl ever ask that? Perhaps not; but it is worth asking. The answer is very simple. Just as we all like stories, so do most of us like poems, which are stories told in words that sound pleasant in our ears, and are easy to remember. But before we can learn poems we learn little verses about funny little folk, and these are called nursery rhymes, because all mothers say them to their children, and the sounds of the words are easy to bear in mind. In this part of our book we have given all the best-known nursery rhymes, many of them having clever pictures with them.

## RIDE A COCK-HORSE TO BANBURY CROSS



Ride a cock-horse to Banbury Cross,  
To see a fine lady upon a white horse;  
Rings on her fingers, and bells on her toes,  
She will have music wherever she goes.

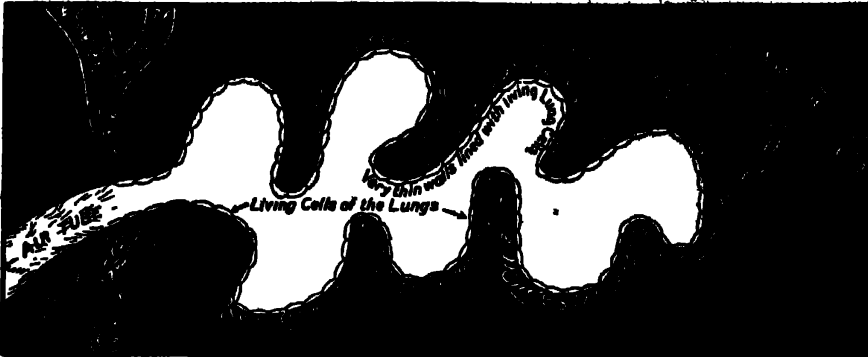


# THE VENTILATION OF JACK'S HOUSE



Air goes in the front door, down the voice-box and wind-pipe, and into the lungs, which are much like sponges, with thousands of hollow spaces lined with living cells. These cells lie between the air and the blood in the hollow spaces, and purify the blood by taking oxygen from the air and sending it into the blood, and by driving the carbon dioxide and water from the blood into the air, to be breathed out again.

## The Book of OUR OWN LIFE



One of the tiny air-chambers in the lungs, magnified to show how its walls have air on one side and blood on the other. Little muscles expand and contract the air-chamber alternately.

## THE WONDERFUL RIVER OF AIR AND THE WAY IN WHICH IT KEEPS JACK'S BLOOD PURE

**E**XCEPT in special need, when Jack is compelled to ventilate his house through his front door, all the air he uses must pass through a complicated filter, warmer, and moistener, which we call his nose. Suppose we have reached the back of his nose, and find a supply of very nearly pure, moist, warm, almost dustless air.

There is some distance yet to go before the air reaches Jack's bellows, or lungs. First it comes to the opening of his great windpipe, which runs down the front of his neck. This pipe must always be kept open, of course, and so it is stiffened with little rings of gristle, or cartilage.

We can readily feel these in our own windpipe just before it leaves the neck and plunges into our middle story. But above the rings there is something much larger, and this is Jack's voice-box, or speaking-machine, of which the proper name is the larynx. Now, before the air which has passed through Jack's filter can reach the windpipe, it must pass through the voice-box.

There is a little risk here, nevertheless. Jack's larynx is, so to say, a new idea, and has had to be contrived

CONTINUED FROM 6234



as an addition to Jack's house. So far as the inlet of air goes, his voice-box is simply a difficulty. It does no good, and it makes no use of the air which goes in—only of the air which comes out.

There are two difficulties, really. First, the air-current and the food-current cross each other's paths—which does not seem to us to be the best arrangement. Jack's wind-pipe lies in front of his gullet, and every morsel of food and every drop of fluid that enters his gullet has to jump over the opening of his voice-box.

To help this business, his voice-box is provided with a movable lid, attached to the back of his tongue, and when he swallows this lid partly closes over the opening to the voice-box, and partly diverts the current of food to one side, so that nothing goes the wrong way. But, of course, while Jack is breathing, his voice-box must be freely open, and therefore it is quite certain that, whatever happens, he must not try to breathe and swallow at the same time; but sometimes he may laugh—which requires a good in-breath—when he is swallowing, and then he is likely to choke. A choking fit may be unpleasant, but at the same

time it is very interesting. Of course, whatever happens, Jack's ventilation must go on, and therefore his ventilation shaft must be kept clear. When he chokes something has got into the ventilation shaft, and immediately the whole body gives up all other interests and occupations and sets itself to expel the obstruction at once.

For this purpose Jack's house is provided with a large number of powerful servants, or muscles, which can all contract the cavity of his chest. No sooner does the ventilation system come to hold an intruder than the sentinels in its walls send up a message to one of the lower telephone exchanges—not to Jack himself—and the order goes forth to cough and cough and cough again. A cough means that we have contracted some of the muscles so as to force air out of the chest quite violently, and thus the obstruction is blown away. Cells inside the windpipe set to work to produce a smooth fluid, so as to make the passage of the intruder easy; and the body will devote itself with such force to this important task that Jack's eyes may fill with tears.

#### THE NARROW WAY THROUGH WHICH THE AIR MUST PASS

When the air, apart from such accidents, has passed into the voice-box, it comes at once to a narrow chink, and through this it has to pass. Such a chink would never exist in such a place, were it not for a very peculiar purpose.

The edges of this chink are made of elastic fibres, and they are there placed so as to make sounds when Jack's air strikes against them in coming out. So we shall return to them, but meanwhile we only note that these vocal cords, as they are called, which line the chink, are so placed that they can be swung apart whenever Jack takes a breath. And that is what happens. Before every breath that Jack takes, from the cradle to the grave, the unsleeping brain-cells give orders to the muscles which stand beside his vocal cords, and then the muscles swing the cords apart, so that the air can enter.

Sometimes certain abominable burglars, called the microbes of diphtheria, get into Jack's throat and produce a thick white stuff which may cover over this chink, and then Jack is in danger of death. But nowadays men call in

horses to save Jack in such a case. Tiny doses of what the microbes make are given to horses, and the cell-chemists of the horses make something which will dissolve this dangerous stuff. The medicine the horses make is called the diphtheria anti-toxin, and it saves the lives of thousands of children and numbers of grown people all the world over every year.

#### THE HUNDREDS OF TUBES WHICH CARRY THE AIR TO THE LUNGS

Now when the passage to the chest is closed, the air has a clear passage down the windpipe until the windpipe splits into two, one going to the right and the other to the left. One branch supplies the right lung and the other supplies the left lung. These branches divide over and over again, like a tree, until at last the air is led, by hundreds of little tubes, to the very stuff of the lungs themselves.

The lungs are certainly a pair of bellows, but we find that they consist of a kind of sponge of thousands of tiny hollow spaces, into which the air enters. These little spaces are lined by the living cells of the lungs, and on the other side of this lining of cells is a tremendous number of tiny blood-vessels which carry blood from Jack's heart. So what we find in the stuff or tissue of the lungs is air on one side, blood on the other, and a layer of living lung-cells in between.

#### THE LITTLE VISITORS TO THE LUNGS AND WHY THEY COME

This blood is not bright blood, but dark blood. It has been sent to the lungs from the right side of Jack's great pump, to which it had just been returned after traveling all through his body. This blood contains a quantity of carbon dioxide, a poison, which it has brought to the lungs from Jack's body, and it also contains more water than it needs. On the other hand, the countless millions of red cells which it contains, the air-ports of Jack's house, are empty-handed. They have no oxygen, for what they got when they were last in the lungs they have given away to Jack's body, and now they have come back to get more from the fresh air that Jack has just breathed in.

What happens, then, is quite simple. Through the thin layer of lung-cells there passes a double stream of gases—a stream from the air to the blood, and a stream from the blood to the air. The

lung-cells supervise and direct them both. The carbon dioxide and the unnecessary water pass into the air—we can see the water when we breathe out on to a window-pane—and the oxygen of the air passes into the blood. In order to make these two exchanges Jack has a ventilation system, and that is what we are all doing day and night without ceasing, as we breathe. We are getting oxygen into our blood, and carbon dioxide and water out of it.

#### THE LITTLE RED PORTERS WHO PACK AWAY THE OXYGEN

The oxygen in the air is at once picked up by the red porters who are in the blood for the purpose, and who can pack away a most extraordinary quantity of it. Of course, a little oxygen can be dissolved in blood just as it can in water, but Jack's house could never do with the little amount which his blood itself would dissolve. The red porters make all the difference. Each of them can squeeze together and pack on his shoulders, so to say, an astonishing quantity of oxygen for his size.

The blood, with its air-laden porters, after leaving the lungs, returns to the left side of Jack's great pump, and is at once driven onward to supply every part of his body with oxygen. All the red cells leave the pump in one great channel, but it soon divides, and one cell may find itself traveling through one of Jack's toes, while another may be rushing through his eye-sentinels. No part of Jack's house is forgotten.

#### THE GIVING OUT OF THE FRESH AIR TO ALL PARTS OF JACK'S HOUSE

In every case the walls of the blood-tubes soon become thinner and thinner. And now we can see happen exactly what happened a little while before in the lungs, except that the process is reversed. In the lungs the red porters got oxygen; now they give it. It is for this that they exist. Most of the cells of Jack's body are far away from the air, and if they are to live air must be brought to them. That is what the bellows and the pump and the red porters exist for. Each little porter hands over to the gasping cells of Jack's toes or eyes or liver or muscles the air that they want; and then the red cells, not quite so red as they were, hasten back to the pump.

But we must not forget the carbon

dioxide and water. The cells want oxygen for burning. They want to get the power and the warmth, and the fuel they burn is mostly carbon—very like our coal—and hydrogen. When carbon is burned with oxygen we get carbon dioxide, and when hydrogen is burned with oxygen we get water. The cells of Jack's house are always producing carbon dioxide and water, and so the blood which leaves Jack's toe or eye is poorer in oxygen but fuller of water and carbon dioxide, and while its empty-handed red cells scurry back to the lungs for more oxygen, it also carries these waste matters, one of which is a rank poison, to the lungs. As soon as they reach the lungs they are breathed out on the air, and this is why the air of a room in which there are a number of people must be constantly changed. If, for instance, a schoolroom is not well ventilated the air which the children breathe will soon have too little oxygen, and they will begin to do poor work.

#### THE OVERSEERS WHO LOOK AFTER JACK'S BREATHING

We may now consider the air which has got into the lungs, and how it gets out again. It is by no means the same air, and is also warmer than when it entered, for it has been for a little while quite close to Jack's warm blood.

The air returns by the same route all the way until it reaches the filter, where it takes a slightly different course. On the way, of course, it has to pass through the chink again, but as a rule it does so without difficulty or sound—though not so, of course, when Jack desires to speak or sing.

For us now one more question remains: What drives the air in when we breathe in, and what drives it out when we breathe out? If we notice ourselves we shall agree, assuming that we are quite well, that it is the breathing-in that costs us effort; the breathing-out seems to do itself, and that is quite true. Breathing-in, or inspiration, is like stretching a piece of elastic, and breathing-out, or expiration, is like letting it go again.

Every inspiration is done by certain of Jack's muscles, which exist for the purpose, and are all under the command of a special group of overseers in the lowest part of his brain. These give their orders for an inspiration about

sixteen or eighteen times a minute, but faster or slower according to circumstances. In fever, or if Jack is running hard, and so using up a lot of oxygen, he breathes much more rapidly. On the other hand, if Jack gives orders himself, on purpose, from his own study, and quickly takes a number of extra long breaths, he will find that for a little while afterwards he scarcely takes any breaths at all. He has no need to do so, for the blood and the tissues have been filled with oxygen by the air from the deep breaths that he has just taken. Deep breathing is very important. By doing this we can push the stagnant air out of the lungs. Our lungs are larger than are needed for everyday use. If this were not true, we should be unable to make any unusual exertion.

It has been proved that the overseers in Jack's brain judge by the quantity of carbon dioxide in the blood which passes through them. If it rises a little, then they hasten to deepen Jack's inspirations until its quantity falls. Their business is to keep the quantity of carbon dioxide in Jack's blood below danger point, and to this end they watch and direct, without a pause, from the first breath that he draws in his life to his last before its end.

#### WHAT HAPPENS IN THE CHEST WHEN WE BREATHE

The chief of the muscles through which they act is the great sheet of muscle stretched between Jack's middle story and his lower story. It is called the diaphragm, and when it gets orders to contract it flattens itself so as to make much more room in Jack's chest, or middle story. Jack could not live very long if his diaphragm stopped working, and it is helped by a large number of other muscles between his ribs. These and various other muscles all have the same action as the diaphragm—when they contract they draw the ribs outward and make the cavity of his chest much larger.

That happens when we work a pair of bellows, and the result is exactly the same. The chest is a pair of bellows, and when it is expanded air from outside rushes in. The air outside has a pressure called the "atmospheric pressure," and directly we create a vacuum, or empty space, in the lungs, no matter how small it is, the atmospheric pressure drives the

air in to fill it. Some creatures force the air in by a force-pump action, just as Jack's pump forces his blood along; but we breathe by a suction-pump arrangement.

#### THE MILLIONS OF ELASTIC FIBRES WHICH STRETCH WHEN WE BREATHE

When the air has entered, and the chest is deepened and widened, its walls are all in a state of being stretched. The ribs are a little twisted, and the muscles are ready to return to their former shape. Further, the lungs themselves contain an enormous quantity of yellow elastic fibres, coiled up in millions and millions all through the lung substance or tissue, and when the lungs are stretched by the air, all these elastic fibres are stretched too, and ready to relax again. So, the instant the muscles of inspiration cease to pull, all these elastic things relax like a rubber that has been stretched, the chest comes back to its old size, the air is squeezed out, and that is how expiration happens. Of course, we can make "forced expirations" when we deliberately use muscles to contract the chest. We do so when we cough, or speak, or sing, or sneeze; but ordinary expiration uses no muscles at all.

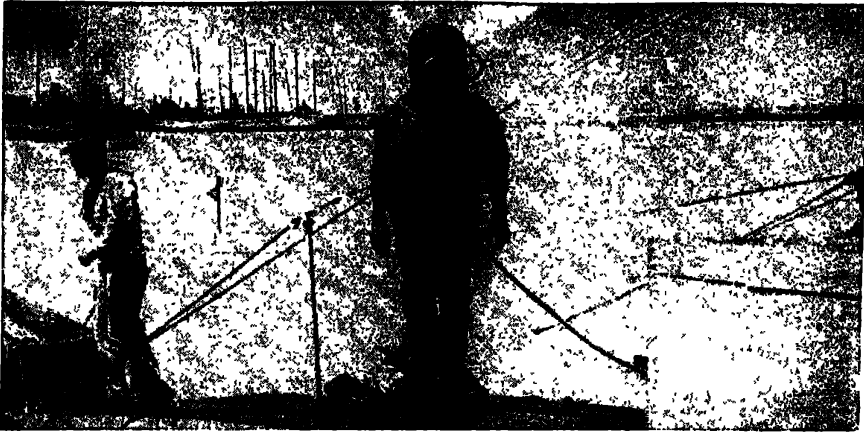
Sometimes, when people are old, or take too little exercise, they lose the proper elasticity of muscles, ribs, and lungs, the lungs are never properly emptied, but remain over-stretched all the time; and all sorts of disasters follow.

#### HOW JILL SOMETIMES FAILS TO COPY JACK'S GOOD EXAMPLE

Breathing is so important that it is one of the things we all do quite naturally without being taught. Only sometimes we adopt foolish habits which interfere with it. Jack is not so bad an offender as Jill in this respect, for she sometimes packs her chest into clothes which prevent her diaphragm from moving and her lungs from filling properly. Nature meant every part of Jack's house to have free play for action, and if she had thought Jack would be better with a strait-jacket she would have made him one. If there is one part of his body more than another which should be perfectly free to move as it will, by day and night, it is the chest or thorax, which provides his every living cell with the air it breathes, and without which he cannot live.

CONTINUED ON PAGE 6353.

## The Book of FAMILIAR THINGS



A life-saving dress in which submarine sailors can float to the surface.

### DOWN IN THE DEEP, DEEP SEA

IN the caverns deep  
of the ocean  
cold,  
The diver is seeking  
a treasure of gold

CONTINUED FROM 6270

The bottom of the sea is rich in a harvest of sunken vessels and cargoes, and how can a diver seek this treasure? It is because he wears a sort of armor, which keeps out the water and brings him air from above. By the help of this armor he can also do much valuable work in constructing and repairing foundations under water.

The diver's suit of rubber covers his body from feet to neck, but leaves his hands free, as his sleeves end in water-tight cuffs at the wrist. He puts on a heavy helmet made of tinned copper, which fastens to the neck of his suit. There are three windows in this headpiece, of half-inch glass, secured in brass frames, and in addition to these there may be a window in the top of the helmet. There is a valve attached to a pipe, through which comes the air pumped from above. This valve is what is called a non-return and is very important, for if the air pipe is broken, the valve closes and gives a short time for the diver to realize his danger and act for safety. A second valve in the helmet lets out the air which has been

breathed. Electric lamps and telephones are provided, so that not only has the diver the means of seeing around him, but he can communicate with those above him regarding his operations, and be communicated with. In order that he may sink down into the water, he wears extra weights of lead secured by hooks at the neck.

A recent invention provides him with what is called a ground block. This is a stand or anchor with steps cut in the side upon which he may ride down and up in comfort. Its purpose is to relieve the diver of the weight of his cable, which is attached to the block. When he reaches the bottom he can set up his anchor and fix his cable on a pulley so that he then only has to drag about with him the part between himself and the reel.

The deepest that a man has ever been known to dive is 306 feet, but men seldom go down more than 100 feet. The deeper down we go, the greater is the pressure of the air. A man who goes down sixty feet has to breathe air at twice the pressure of the ordinary atmosphere. The result is that the air taken into the blood is forced by the pressure into froth and bubbles, and some of the tissues of

the body give off this air very slowly, so that if a man comes up suddenly, many of these bubbles remain in his blood. This may cause paralysis or death. To guard against this, a man must take a long time in coming up out of the water, resting at different depths, so that the bubbles may disappear. A time table for divers has been made so that they may know how to descend, and work and come up again with the greatest safety.

#### **L**IGHTENING THE DIVER'S LOAD

The diver often has to do heavy work in attaching cables and otherwise helping to recover wrecks and cargoes. He needs hammers, drills, scrapers and cutters. He needs some way of carrying these to the bottom of the sea, and of storing them while at work. For this a clever inventor has made a submarine air-room, which can be lowered to the sea bottom from the surface, with which it is connected by air-hose. It carries telephone cables and serves as the diver's base, instead of the ship. There he can keep his tools, and there he can retreat for safety from rapid currents or if anything goes wrong with his suit or connections. His own line runs horizontally from it, instead of vertically from the ship above, and is thus less liable to accident from currents. So many ships with valuable cargoes were sunk during the Great War that divers will be busy for many years seeking to recover the treasures.

#### **H**OW A DIVER CAN BE INDEPENDENT OF THE AIR-HOSE

Divers are carried by every man-of-war. If anything happens to the ship below the water-line, the men put on their dress, go down with tools, and repair the damage. One kind of diving suit has attached a cylinder of compressed air, and with this the diver is not encumbered with air-hose and cannot be suffocated by a kink in it caused by a current. To make his supply hold out for a long period of time he has an air purification circuit similar to the one described below.

Another invention, for submarine vessels, is a strong helmet and a water-tight jacket. In the jacket pocket is a substance called caustic soda or potash, which, on coming in contact with the sailor's warm breath, gives off oxygen, and so acts that the poisonous carbon

dioxide from the man's breath is absorbed. By this means, the air inside the helmet and jacket can be breathed again and again. The submarine sailor, in case of accident, puts on this dress and floats to the surface, when the dress acts as a life-buoy, keeping its wearer afloat until he can be rescued.

#### **A** BRAVE DIVER WHO BEAT THE WORLD'S RECORD IN DIVING

In March, 1915, the submarine F 4, belonging to the United States Navy and carrying a crew of twenty-one men, disappeared in deep water off Honolulu. Divers at once went to the scene of the accident to locate the sunken boat, and thirteen descents were made, every one of which broke a world's record for deep sea diving. Five were made to a depth of 306 feet, and eight to 275 feet. The former world's record was 274 feet. And for the first time in the history of diving, a telephone device was used successfully in communicating with the men under water. At last the submarine was found—288 feet below the surface—with a hole in her side. The diver who discovered her was under water for two hours, five minutes for the descent, twelve minutes on the bottom and one hour and forty-five minutes in coming up.

It was decided to raise the submarine to the surface by attaching cables to her hull and gradually drawing her into shallower water, whence she could be raised. Every day, when the currents allowed, divers were busy fastening these cables. Again and again they had to be renewed, for the rapid currents parted them. One morning, after the work had been going on for about a fortnight, a diver went down and successfully accomplished his task. As he was being brought to the surface he became entangled in one of the lines attached to the underneath craft. He signaled to the ship above and another diver, Frank Crilley, who had already made a record, went down to his rescue. Both men worked strenuously to disengage the line to the submarine from the air tube and the line attached to Loughman's apparatus. After heroic efforts, lasting for four hours, the signal came for the final raising to the surface. With what a will those aboard the ship obeyed! Crilley came up first, and then Loughman, exhausted but otherwise unharmed.

THE NEXT STORY OF FAMILIAR THINGS IS ON PAGE 6357.

## THE DIVER PREPARES TO GO DOWN



The diver's dress is the result of centuries of experiment, and enables a man to keep under water for five or six hours at a time. The dress consists of a waterproof garment, heavily weighted, massive, heavy boots with leaden soles, and a metal helmet. Here the divers are beginning to put on their costume.



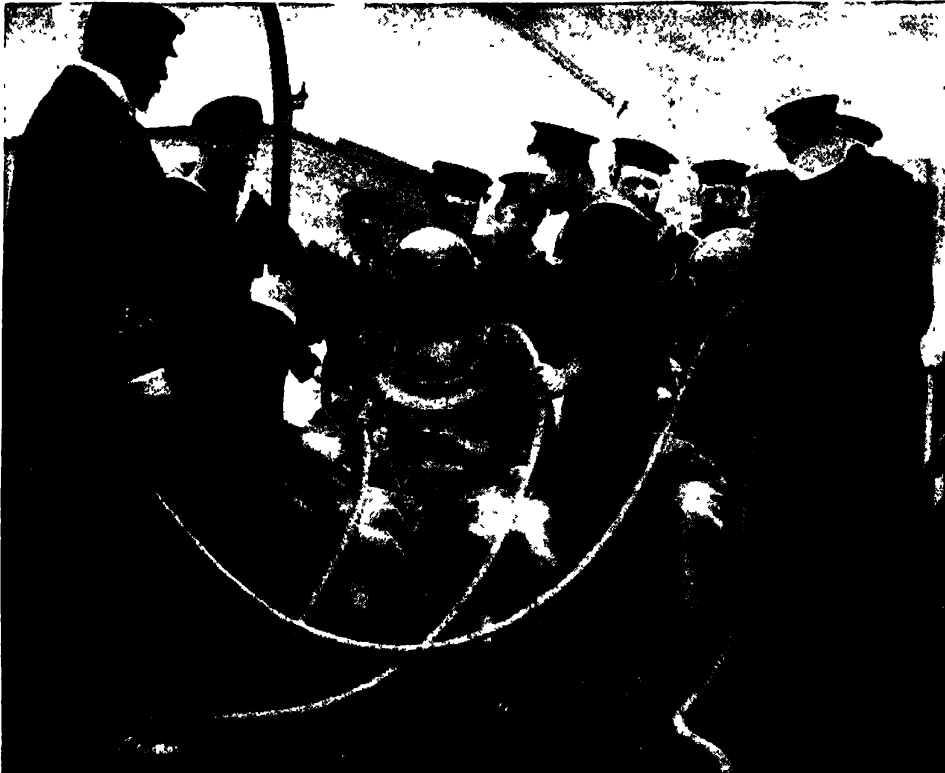
After the diver has put on ordinary clothing, he is helped into a waterproof garment, which covers his whole body, except head and hands. He needs warm clothing, as it is cold working under water.



In this picture the diver has on the waterproof garment and the heavy boots. The rope by which he will be lowered is already round his waist, and he is about to have the helmet put on his head.



## TALKING TO A MAN DOWN IN THE SEA



These pictures show a diver going down into the sea, and a man talking to him by telephone. The diver's helmet has three glass windows, and is fitted with valves, so the air he has breathed can escape. Fresh air is supplied through a tube that connects the helmet with an air-pump worked from above.

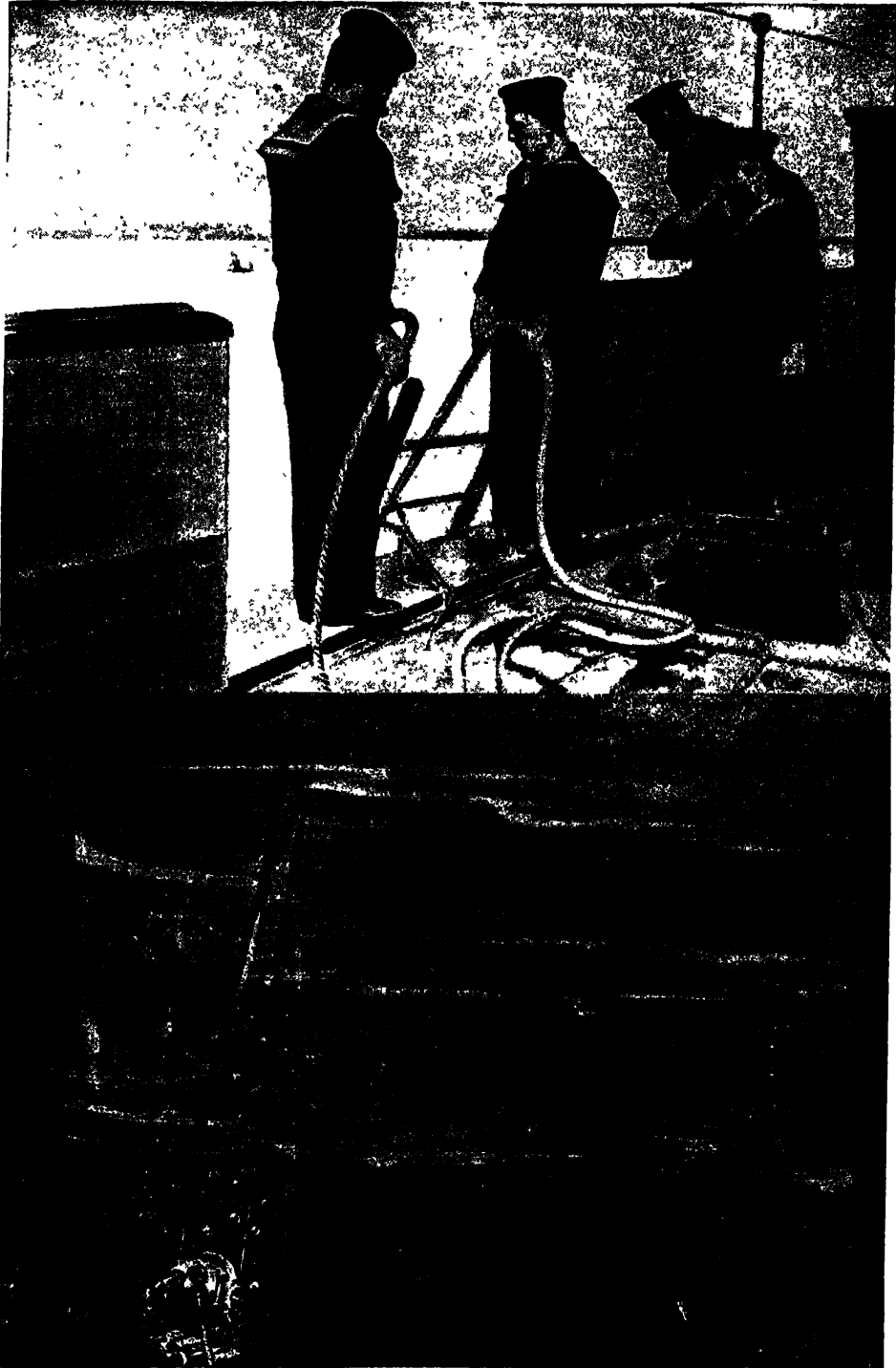


The diver's costume weighs about 150 pounds, but so buoyant is the water that he has to put his feet under the ladder rungs to pull himself down.



Communication is kept up by means of the telephone. One sailor is here seen speaking to the diver while the other is working the air-pump.

## THE MEN ABOVE AND THE MAN BELOW



In this picture the diver is working under the sea, while in the ship above one man holds the rope by which he is raised, another has charge of the air-tube, and a third is telephoning to the diver. The greatest depth to which a diver has been known to descend is 306 feet, but divers can rarely work farther down than 100 feet. A complete diving costume, with all the necessary apparatus, costs several hundred dollars, but this is cheap, when we take into account the valuable work the diver does.

The photographs on these pages are by Stephen Cribb, and others.

## THE DIVER COMES BACK TO THE BOAT

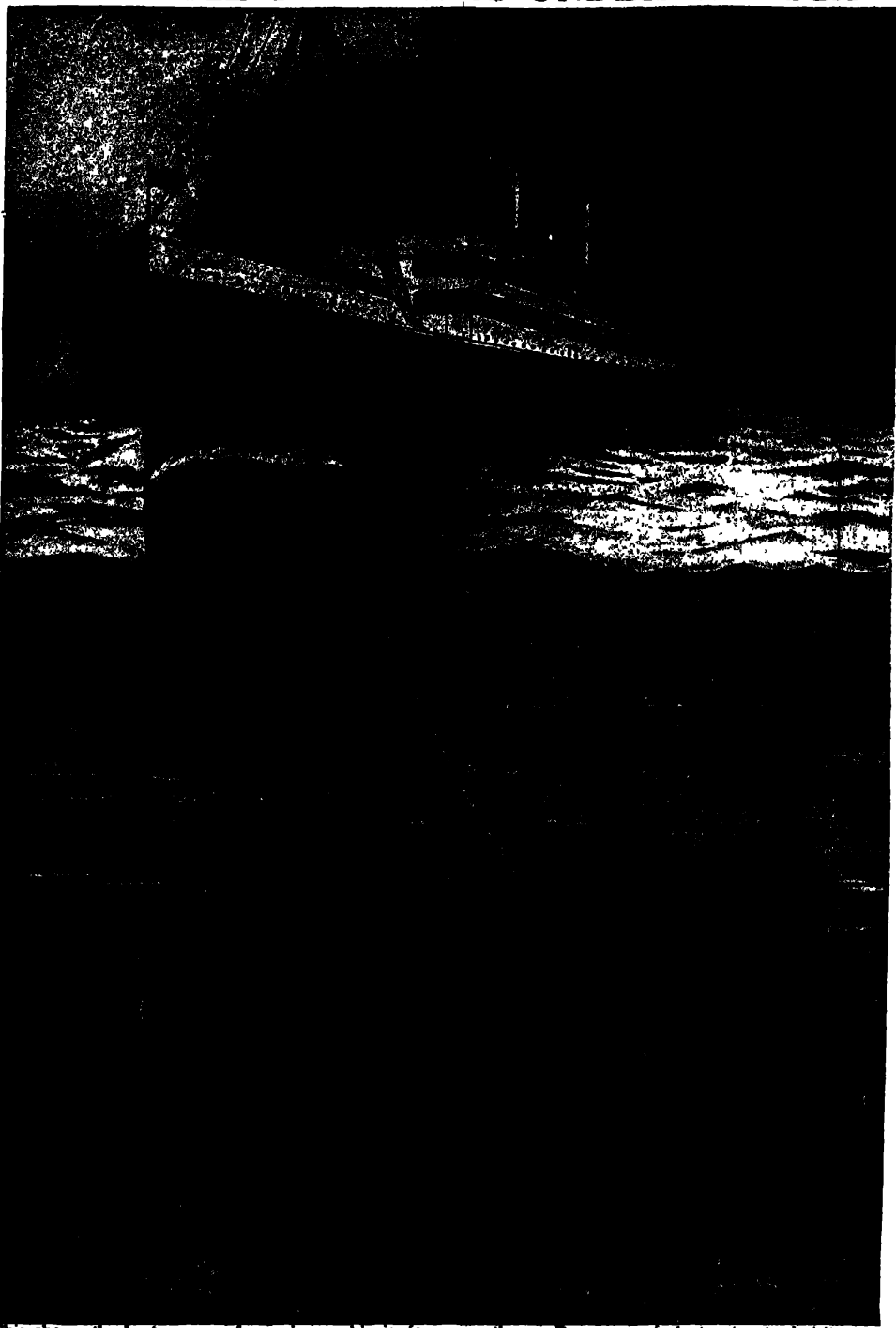


On this page we see how a diver works from a small boat. There is no telephone, and the diver communicates with those above by signaling with a rope. He can get to the place where he wishes to work either by descending a ladder that hangs over the side of the boat, or by being let down by a rope.



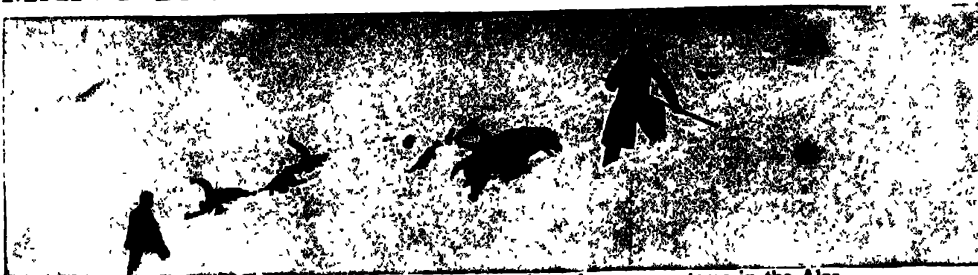
The diver is pulled to the surface by the rope round his body. The invention of diving apparatus has led to the recovery of a vast amount of treasure. From one ship alone that foundered in sixty feet of water, nearly \$1,000,000 was recovered by the brave divers. In the latest kind of diving-dress the diver carries a cylinder of compressed air on his back, and is independent of help from above.

## THE BELL THAT RINGS UNDER THE SEA



This shows the best means of warning a ship in foggy weather. By means of electricity, the lighthouse-keeper rings a bell under the sea. The ship has inside its hull on each side a microphone, which collects the sound of the bell as it passes through the water in the direction of the dotted line, and magnifies it. A wire connects each microphone with a telephone receiver in the wheel-house, and by turning his ship until he hears the bell equally loudly from each side, the captain is able to point his ship towards the bell. His chart marks the position of the bell, and he is thus able to know exactly where he is.

## MAN'S BEST FRIEND AMID ETERNAL SNOWS



St. Bernard dogs rescuing exhausted travelers after a snowstorm in the Alps.



Eskimo dogs dragging a sledge over hillocks of ice.



Dogs of the Monastery of St. Bernard, famous for their heroism in rescuing travelers.

# DOGS OF MANY DIFFERENT KINDS, SHAPES AND SIZES



FOX TERRIERS



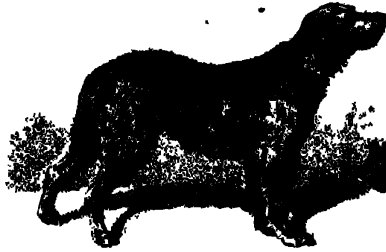
YORKSHIRE TERRIER



KING CHARLES SPANIEL



BLEMHEIM SPANIEL



AIREDALE TERRIER



SCOTCH TERRIER



IRISH TERRIERS



FOXHOUND



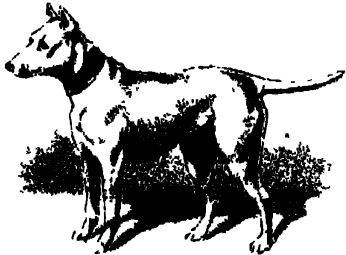
BOSTON TERRIER



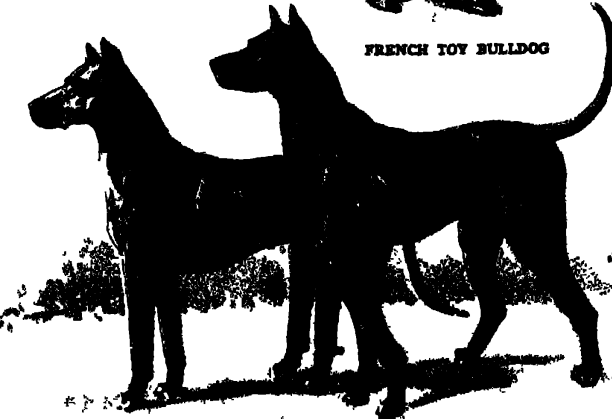
ENGLISH BULLDOG



FRENCH TOY BULLDOG



BULL TERRIER



GREAT DANES



COCKER SPANIEL

© 1918-FEWRIGHT

Different breeds of dogs vary more than horses or cattle. Some weigh only a few ounces while others are strong enough to kill a man. Some are useful because of their wonderful noses while others are valued only for pets.



# The Book of NATURE



Eskimo dogs, from the fine copyright painting by Miss Maud Earl of "The End of the Trail."

## THE STORY OF YOUR DOG

THE lover of the dog would be lost without the faithful creature which guards his home, or keeps him company on his walks. The dog is a very emblem of faithfulness. When it has become fond of a human being, nothing will change its feelings. Starvation and ill-treatment will not kill its devotion. It is almost more than human in its constancy. No matter how poor a man's home may be, his dog cheerfully stays with him, content with scanty food sweetened by a caress and a kind word now and then. Those who keep their dogs in luxury can hardly realize the intense devotion which the animal is capable of displaying when it is called upon to bear hardships and privation with its master and mistress. Dogs remember their friends for a long time, and will recognize them after an absence of years. They will often refuse to give their love to new owners and will pine away when sent among strangers, and they have been known to travel long distances through country unknown to them to find their way to their old homes.

Dogs were the first tame animals which man possessed. It is thousands and thousands of years since the children of the cave men and the lake dwellers of Europe tumbled about and played with the puppies whose de-

CONTINUED FROM 6247



scendants are our dog friends of to-day. Some of the races of dogs that we know are, we might say, almost as old as some of the races of man that now exist in the world. We know from the pictures on their ancient temples that the Egyptians hunted with greyhounds from very early times. The Assyrians had large dogs which tradition says the Phoenicians brought to Britain, and it is said that possibly the dogs whose pictures were carved by the Assyrians on their walls were the ancestors of the prize English mastiffs at an American dog show. Other people say that it was the Romans who introduced the mastiff to their colonies in Britain. Wolfhounds too were known from very early times. The Egyptians had them, and it is said that Irish chieftains owned the ancestors of the Irish wolfhound and Scotch deerhound when the Romans held Britain, while a Roman historian says the Roman soldiers used bloodhounds in their wars against the Gauls.

With the exception of the islands of Madagascar and New Zealand, and some of the Polynesian Islands, there is not a country in the world in which dogs have not been found, either as friends of the people who lived there, or, in a wild state, hunting for themselves in packs, as the wild dogs do in India. Perhaps, however, there is one



other exception, for we cannot be sure that the wild dog of Australia, the dingo, was not brought to that continent centuries ago by the ancestors of the people whom the early English explorers and settlers found living there.

#### ANCIENT FRIENDSHIP BETWEEN MEN AND DOGS

The friendship between men and dogs is so old, that it is no wonder that its beginning is lost in mystery. At first sight it looks as though they must be descended from wild dogs, such as those of which we have spoken, but this is not so. Learned men who know about these things say it is much more likely that the wild dogs are descended from tame dogs, that wandered away, just as the troops of horses on the Western plains came from tame horses that had escaped from the Spanish settlers, and gone wild.

Probably all our dogs, whether they are large or small, rough or smooth, whether they hunt for us, or guard our flocks or our houses, are descended from wolves and jackals. It is perhaps hard to believe that our faithful, loving, intelligent pets have come from fierce wolves or hungry jackals, but it is believed that they have.

If you were to go into a museum, and look at the skeletons of dogs and wolves and jackals, you could not tell one from the other, unless you had read the labels. Perhaps you have wondered why your favorite dog turns himself round and round before he curls himself up on his cushion or his rug to go to sleep. Next time you see your pet do this, you can remember that his wolf or jackal cousin does exactly the same thing when he is trying to find a comfortable resting place in his stony or grassy lair. Perhaps some of our dogs are descended from foxes, which also are included in the dog family, or they may have come from another wolf-like animal that has died out, but few people think that either of these suppositions is possible. It is generally believed that dogs as a separate race, as we know them, did not exist when man first appeared in the world.

#### HOW THE FRIENDSHIP BETWEEN MEN AND DOGS BEGAN

And now comes the question, how were the animals tamed from which our dogs are descended. As we have seen, ages of time have gone to make the friendship between men and dogs what it is to-day, and to look for its beginning we must go,

in imagination, far back to the early history of the world, that we have only of late begun to dig out of the earth.

In early times, man was not a tiller of the ground. He did not sow grain, or plant vegetables. He learned in course of time that certain fruits, and berries and nuts were good for food, and as certain animals, which do not rank high in the scale of creation, have the sense to store food, we may imagine that man, even in the early dawning of his powers of mind, did something of the same sort. He did not, however, store up his food on any large or systematic scale. His storehouse, and his very home, might at any time be raided and seized by some one more powerful than himself, or his cave might be invaded by savage beasts. No man will lay up store for the future unless he can be reasonably sure that the store will remain safe to serve the purpose for which it is intended. All this makes it plain to us that man, in the early days, must have lived what we call a hand-to-mouth existence. For months in the year, when there was no vegetable food available for him, he was forced to eat animal food to keep him alive, and to use the skins of the animals that he killed, to keep him warm.

From the moment then that we find the first traces of man on the earth, he was a hunter. For long ages, there was war between him and the animals, and all the flesh-eating animals—the carnivorous animals—warred on him. Now among the flesh-eating animals are numbered all the members of the dog family. Except the fox, these animals, when they are pressed by hunger, hunt in packs, for so they are able to attack large game, and pull down animals much larger than themselves. Man cannot be classed among the large animals, but the wolves soon found that he could easily outwit a single animal. Still, many a man fell before the combined onslaught of the pack, and numbers were killed, as they are still killed in Russia, and in the wild parts of our own continent and of Asia.

But man was more clever than any of the beasts. Though he had only two legs, and could not equal his four-footed enemies in speed, he had the advantage of having two hands free. He quickly learned not only to use the weapons that nature left ready to his hand, but to manufacture new ones. He could throw

a club, or a roughly made spear. He could gather up large stones, and throw them at his pursuers and kill them. That marked him off from the rest of creation. Other animals had to approach and make a close attack upon their prey. Man could stand and hurl a weapon at whatever he wanted to kill.

He probably soon noticed too that the animals that provided for him the best food, were the vegetable-eating animals, and unless they molested him, he let the carnivorous animals alone. But the animals that man slew for food were just the animals upon which the dog family themselves depended for food. Man left large portions of the flesh and bones of his prey upon which these animals could feast, and they could rob him of even the portions that he had hidden from them, just as wolves rob caches made in our own time by travelers in the wild.

#### THE FIRST PARENTS OF OUR PETS

But man could combine, too, and when the depredations of the wolves and jackals became too bold, probably our wild ancestors banded together, tracked them to their lairs, and killed, or drove them off. Among them, however, there were sure to be young animals, and some of these the cave men probably brought back to their rude dwellings. Probably, even if they objected to the flesh of grown wolves the young animals provided food to their liking. But we may imagine the cave children commencing to play with the little dog-like animal that the men had brought home, and begging to keep it. Then the children, as children will, divided their food with their new playmates. Every one who has much to do with dogs, knows what a difference kindness shown to them in their puppy days makes in their dispositions, so the young wolves or jackals, or perhaps both, grew to love their masters, and later on helped them to hunt. Then seeing their usefulness, the cave men caught more young animals, or, when they drove away wolves or jackals from a good cave in which they wished to live, they kept the young animals. By and by these tame wolves and jackals brought up families of their own. We know from experience in how short a time what we call a new breed of dog appears. For instance, the black retriever is descended from the black Newfoundland and the setter; and the tiny

toy dogs that we see carried about in ladies' arms have been brought into the world by selecting for generations the very smallest Pekingese, Japanese, Pomeranian, or other kinds of dogs. So it is likely that the families of tame wolves and jackals quickly changed their form, and with every generation they grew further and further away from their savage cousins of the woods or plains.

Soon a strong friendship grew between man and dogs, and a kind of partnership was made between them. The dog hunted for man, and man killed the game, fed the dog and provided it with a warm shelter.

#### THE SHEEP-DOG AND ITS CLEVER WORK

The friendship that grew up between men and dogs still exists, and the companionship between them is closer than ever. As civilization advanced, however, and man became independent of hunting, he became less dependent on the dog for aid. Nevertheless, in many countries, away from towns and cities, the old partnership between men and dogs exists in something like its ancient form. The shepherd who watches his flocks upon the mountains would be helpless without his partner. The sheep-dog knows its master's sheep as well as the shepherd, perhaps better than he. It will fetch a lamb out of a strange flock, and restore it to its master's fold. It will collect sheep that have scattered and strayed upon a hill in the mist; it will drive home, unharmed, the lost lamb, the sheep which has been frightened away from the flock.

Other dogs which work for their living are the pointer and the setter, the retriever, the terrier, and the foxhound.

But it is the sheep-dog that we single out as the best representative of the working dog to-day. Wherever the sheep-dog is at work, observers notice that it takes itself very seriously. It loves the shepherd, but it seems to regard its work as of first importance.

There are many different kinds of sheep-dogs, some long-haired like the Scotch collie, with its beautiful silky coat, and long brush-like tail, and some with a rough, shaggy coat like the old English sheep-dog.

Indeed every country may be said to have its own sheep-dog, of which it is exceedingly proud, and with reason, for sheep-dogs are the most intelligent of all

dogs. Probably they are descended from dogs which were first used merely to guard the flock and chase away wild beasts. Only the wisest puppies of these dogs were kept; and in course of time they learned to round up and help to bring home the flocks and herds. Faithful friends and wise and loving companions though they are, we are almost tempted to say that it is cruel to keep sheep-dogs in a city. People who have only seen them trotting along at their owner's heels or running about with muzzles on have no idea of their capabilities. It is a beautiful thing to see a well-trained, fleet-footed sheep-dog at work with its master. It watches every motion of his hand, heeds every tone in his voice or even the sound of his whistle, and quickly and silently gathers in the flock or herd with only now and then a short, sharp bark to impress upon a laggard the need for speed.

#### THE INTELLIGENT DOGS OWNED BY SIBERIAN SAMOYEDS

The dogs used by the Samoyedes may be classed among the sheep-dogs, for though the Samoyede tribesmen have no sheep in their Siberian home, they use their silvery white dogs to help them to look after their great herds of reindeer. But the usefulness of these wise little beasts does not end with guarding the herds. They find out fords in the rivers for their masters, tow boats along the streams in summer and sledges over the snowy ground in winter, and hunt seals and bears and wild geese. One peculiarity about these dogs is that from among the pack they seem to elect one dog who acts as its leader and chieftain.

Many instances are told of the faithfulness of sheep-dogs to their trust, but we have room for only one or two.

Not very long ago an American shepherd died, and was not found for two days. The dogs went on with the flocks; they drove them gently forward up to the high-lying feeding lands to which they were intended to go, stayed with them, then turned them homewards. Of this faithfulness there is a more charming example, with which many are familiar.

Hogg, the Scottish poet-shepherd, had a fine sheep-dog. One day a great snow-storm swept down over the moors where Hogg's sheep were pastured. Hogg called up the dog, and sent it off in one direction, while he himself took an oppo-

site route. Late at night Hogg returned with his half of the flock, but could see no sign of the dog. Long and anxiously he awaited its return. At last there came a gentle scratching at the door, accompanied by a low whine. He opened the door, and saw all his sheep safe and the dog standing there with a tiny puppy in its mouth. It placed the puppy at its master's feet, then raced off into the snow, soon returning with a second puppy, which, like the other, had been born out in the snow. The faithful creature had gathered the sheep and brought them home, but it had brought home also its puppies, as if to beg from its master the protection it was itself unable to give.

#### THE FRIEND OF ALPINE TRAVELERS

That is the stage to which the partnership between man and his best animal friend has come. But there is other work than sheep-minding for the dog to do. How many lives have the mighty St. Bernards saved up in the Alps? They are trained by the kind-hearted monks to go out on to the snow-covered mountains, and to find travelers who have become exhausted by the cold. The dogs call assistance by their barking. They themselves carry a little barrel slung round their necks containing refreshments. One of these dogs, a noble creature called Barry, saved the lives of forty persons lost in the snow. He found a little child lying in the snow under the influence of that fatal drowsiness. The dog roused the little sleeper by licking its face, then, lying down, allowed the child to climb upon its back, and so carried the little wayfarer in safety to the monastery.

Dogs such as Barry are big and strong enough to kill the people whom they save, and it must have been a timid person, fearing that Barry had some such intention, who caused the animal's death, for one day this grand old dog was killed. A pathetic inscription is set up over his grave: "Barry, the heroic. Saved the lives of forty persons, and was killed by the forty-first." There is not now so much need for the St. Bernards, for the railway carries people so easily through the mountains that few run the risk of crossing through the pass in autumn or winter weather. But they are still faithful to their task, and many a wayfarer owes his life to their care.

## THE OLD SHEPHERD'S LAST FRIEND



THE DEAD SHEPHERD AND HIS DOGS, FROM THE PAINTING BY HENRY H. EMMERSON



THE OLD SHEPHERD'S CHIEF MOURNER, FROM PAINTING BY SIR EDWIN LANDSEER



FAITHFUL DOG AT HIS MASTER'S GRAVE, FROM PAINTING BY SIR EDWIN LANDSEER

## THE DOG USED AS A BEAST OF BURDEN

When primitive men first began to make tools, and with them to model contrivances with which they could carry things, doubtless ice-sledges, to which they could harness dogs, were among the first conveyances that they fashioned. This is suggested by the fact that the Eskimos have used dogs as beasts of burden ever since they have been known to travelers.

The Eskimo dog is the animal which shows us most clearly what our own dogs used to be like. It matters not where you find him—in Arctic America, in Siberia, in Kamchatka—he is always the same, a sort of moderately tame wolf. When at liberty he mixes with wolves, if there be wolves about, and in a pack of Eskimo dogs in Arctic America there is almost certain to be as much of the wild wolf as of the true Eskimo dog. In these far northern regions we get a glimpse of the way in which our ancestors and the dogs' ancestors got on together. The Eskimos must have dogs to enable them to move their encampments from place to place. But when the day's work is done the dogs become simply wild animals. They get a few mouthfuls of fish for their wages, take a gulp or two of snow, and that is their supper; they will get nothing more from their master until the morrow, when another piece of fish will be thrown to them. They must hunt for themselves if they need more. And they do hunt, with the result that it is impossible to keep sheep, or goats, or birds where these dogs are. They kill and eat anything, and fight among themselves with terrible ferocity. Doctor Nansen, when he was exploring in the Arctic regions, lost several of his dogs from this cause. When they were liberated at night they would start a quarrel, and every one of the pack would turn upon the dog which seemed to be getting the worst of the battle, and kill it.

Although they are quarrelsome, however, Eskimo dogs are faithful to their masters, and in intelligence they are not very far behind the sheep-dog.

## THE AID GIVEN BY DOGS IN TIME OF WAR

After the Great War began teams of Alaskan "malamutes" were sent to the Vosges Mountains to help to bring food and ammunition during the winter months to the French army at the front,

and a French writer says that nine of these dogs could easily draw over a bad road, loads that would tire six horses on a good road. One of the teams was employed in a part of the mountains where they had each day to travel round a mountain. This went on for some time, and then one day the dogs themselves suddenly turned into a short cut, of the existence of which their leaders had not had the least suspicion.

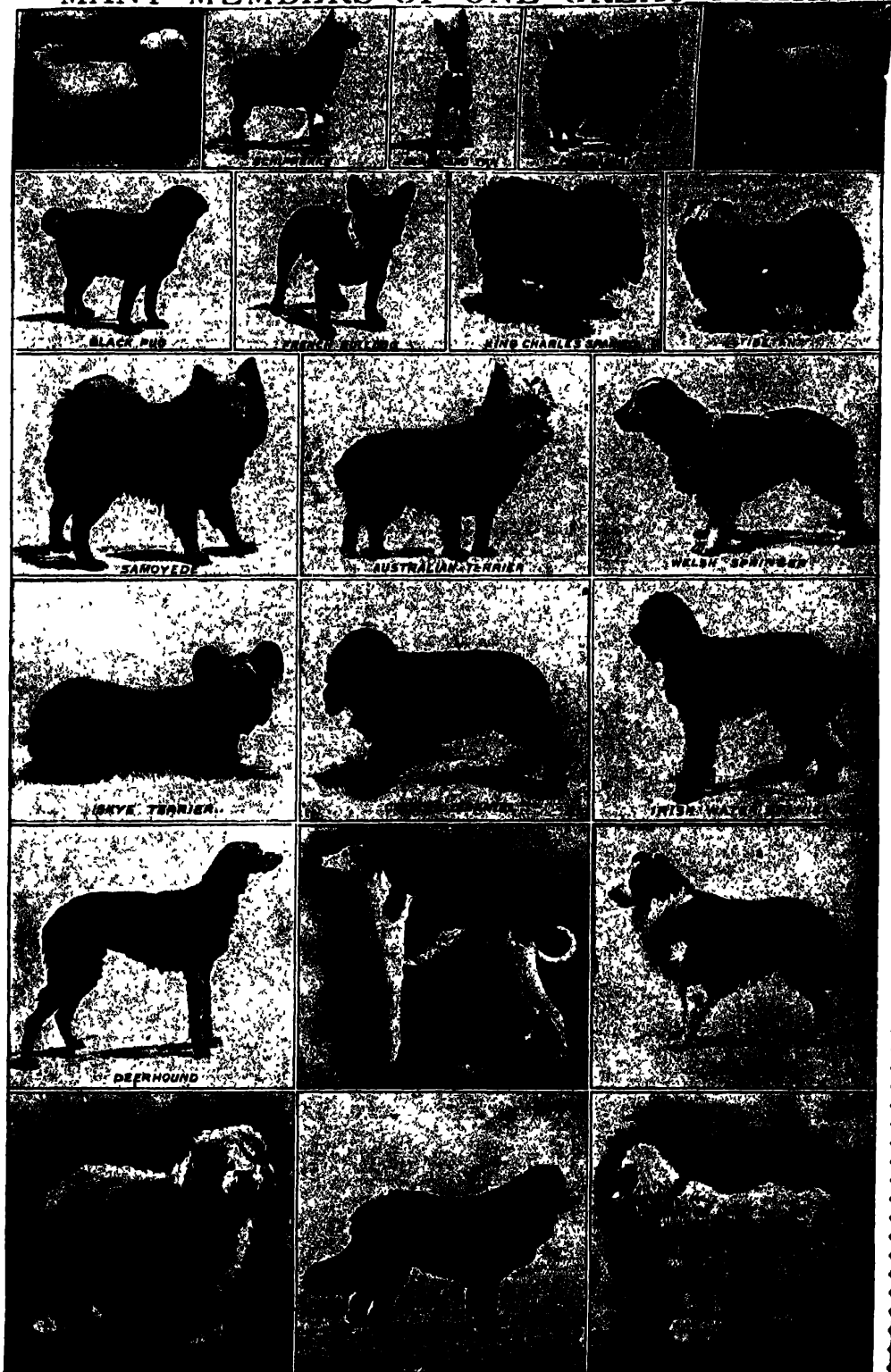
Dogs are used in many ways in war time. They are used in Belgium and Holland to draw light guns over the sand dunes; but this is only a small part of their usefulness. They are the most watchful sentinels, and are trained to give notice without barking of a surprise attack; they carry messages from place to place, and will even deliver a message to the man they are ordered to find; they draw small ambulances, and above all they seek out and bring help to badly wounded men whom otherwise the Red Cross workers might never be able to find.

Special kinds of dogs, like the dogs used to draw the Belgian milk carts, are used to draw the guns, but sheep-dogs, because of their faithfulness and intelligence, make the best Red Cross dogs. Airedale terriers, too, make excellent war dogs, and this brings us to another ancient kind of dog—the terrier. Terrier means "earth dog," and for centuries terriers have been used to follow the fox, the otter and other burrowing animals into their homes and drag them out, or else keep them from escaping until the hunters can dig down to the burrow. There are many varieties of terriers, of which the best known, perhaps, are the fox terrier, the black and tan, the Airedale, the Irish, the Scotch, the Skye, the Dandie Dinmont and the Yorkshire. Some of them are rough haired, some smooth. Some are very small, some, like the Airedale, are of a good size; but they are all brave, intelligent little animals, and faithful, loving companions.

## THE MANY DIFFERENT VARIETIES OF DOGS

There are so many varieties of dogs that it is difficult to speak of them all. Hunting dogs, or hounds, alone give us many varieties; but they may be divided into two large classes: dogs who hunt by sight or rely on their swiftness to catch their prey, like the greyhound, and the wolf and deerhounds, and dogs that tire-

# MANY MEMBERS OF ONE GREAT FAMILY



These pictures of prize dogs give some idea of the astonishing variety in the dog family.

lessly run down their quarry by scent alone, like the foxhound, the beagle, and the bloodhound. These dogs like to hunt in packs, and their bark has a deep bay-ing sound. Bloodhounds, which have been known since the time of the Romans, have an especially keen sense of smell. They have often been used to track slaves and criminals, and many a lost child has owed its safety to the tireless tracking of a faithful hound. Bloodhounds are naturally gentle, peaceful animals, but can be trained into great fierceness. Greyhounds are smooth coated, but deerhounds usually have rough coats, and the

the special races of dogs came into existence. They are all clever, and easily trained by kindness. Setters, pointers, and retrievers, like the dogs of old time, find the game that their masters have shot. When it has found the wounded bird or animal the setter sits down and waits for its master to come up, the pointer stands quivering, with nose pointed straight toward the game, and tail outstretched, but the retriever, cleverest of all, fetches the game from the place where it has fallen. This writer's mother owned a large black retriever that would swim out into the water, take a



Belgian Milk-sellers with their picturesque Dog-carts.

borzoi, or Russian wolfhound, has long, silky hair.

The long legs of the greyhound family, and their slim bodies, enable them to run with great speed, and to make long leaps. One beautiful borzoi that we knew could leap seventeen feet at a bound, and has been known to pass a runaway horse.

Several kinds of dogs have been trained to help the police in large cities. This is done chiefly in the European cities; but a beginning has been made in some of the cities of this continent.

#### HOW DOGS HELP THE SPORTSMEN

Dogs like the hounds, of which we have spoken, and setters, pointers, spaniels, terriers and retrievers, are called sporting dogs. It would take too long to tell how

wounded bird in his mouth, swim back with it, and lay it gently at his master's feet without having hurt a feather. Retrievers are very intelligent, and quickly learn to obey commands, and remember what they are forbidden to do.

This same dog, when he was a puppy, tried to follow his mistress to church one day. When she reached the gate, she sternly told him to go home, and closed it. He looked at her beseechingly, then turned and soberly trotted homeward, and though he lived to be old and gray, and was her constant companion in her walks, he never again attempted to follow her on Sunday morning. Nor did he ever attempt to follow the children to school, though he was always their playmate and protector when they roamed in the fields

# SPECIMENS OF THE MOST USEFUL BREEDS OF DOGS



GORDON SETTER

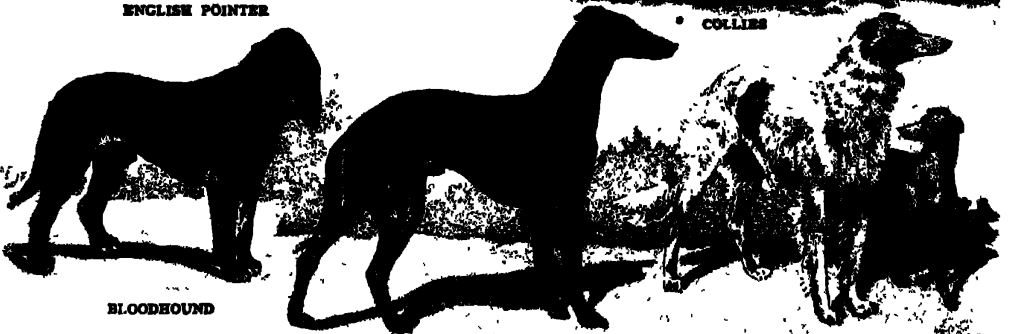
IRISH SETTER

YORKSHIRE TERRIER



ENGLISH POINTER

COLLIE



BLOODHOUND

GREYHOUND

RUSSIAN WOLFHOUND

ITALIAN GREYHOUND



ESKIMO DOG

ROUGH-COATED ST. BERNARD

SMOOTH-COATED ST. BERNARD

NEWFOUNDLAND

TERRIER

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This page shows several useful dogs. Pointers and setters hunt birds, collies guard sheep, and the greyhound is used in the chase. Eskimo dogs are beasts of burden, and all of you have read of St. Bernards and Newfoundlands.





and woods around their home. Once this dog was taken a long distance to a shooting party, and did his work so beautifully that the host at the party begged to be allowed to keep him for a few days longer. Next day the man who borrowed him telegraphed in great distress. The

try from a place to which he had been taken a roundabout way by train.

All dogs, whether they hunt for their masters, or help him to find the animals he has killed, or safeguard his flocks and herds, or, like the mastiff and the bulldog, watch and guard his property, may



"Dignity and Impudence," from the Painting by Sir Edwin Landseer.

dog was lost, and could nowhere be found. There was great mourning and indignation in the family when the news was told to the children, but in the morning, the household was awakened by a dog's loud barking. Dash had come home, and was announcing the fact with all his might. Afterward his homeward course was traced, and it was found that he had come fifty miles, straight across the coun-

try from a place to which he had been taken a roundabout way by train. All dogs, whether they hunt for their masters, or help him to find the animals he has killed, or safeguard his flocks and herds, or, like the mastiff and the bulldog, watch and guard his property, may be called friends of man. It does not matter whether it is a poodle whose grandfathers and grandmothers have had their names in the dogs' "Who's Who" for many generations, or a Pekingese whose ancestors lived in Chinese palaces for centuries, perhaps, or only a mongrel whose origin no one knows, a faithful dog will cling to his master till death.

THE NEXT NATURE STORY IS ON PAGE 6371.

## HANNAH DELIVERS SAMUEL TO ELI



Hannah had vowed if God would give her a son she would give him to His service. Her prayer was answered. The good woman remembered her vow, and as soon as she was able she brought the infant, whom she had named Samuel, to the old priest, Eli, and gave him up to the service of the Tabernacle.

This beautiful picture is from the painting by Mr. F. W. W. Topham



## THE SCATTERED NATION

THE "Book of All Countries" has now described the principal countries of the world and the people who live in them. We have read of England and the English, France and the French, of Russia and the Russians—to name only a few—and given pages of text and pictures to many very small countries with few inhabitants. Yet we have omitted one of the most important and influential peoples of the world.

We cannot find their state on the map, for they have no separate country of their own, but are scattered over the whole world. They are to be found on every continent and in almost every country. In America they are Americans; in England they are English; in the German Empire they are Germans, and yet they have not been swallowed up in these great nations.

Usually when people come to live in a country, their children intermarry with the natives of the country or with other immigrants and in a few generations the original blood can hardly be traced. Many American citizens can find among their ancestors, Englishmen, Frenchmen, Germans, Irishmen or Scotchmen who came here years ago. The people of whom we speak have not been lost in this way, but are yet distinct. Still, some of them are among

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CONTINUED FROM 6229

the best citizens of the countries in which they live.

Who are these people and where do they come from? They are the Hebrews, commonly called the Jews, and their story is perhaps the most wonderful in all history. There is no other tale like theirs. If you will turn to the map on page 3857 and will get your Bible, we shall soon find out some things about them. Here is the beginning of the story as told in the Bible.

### THE BEGINNING OF THE HEBREW PEOPLE

Long, long ago, around a city called Ur of the Chaldees, some of the descendants of Noah lived. Among them were Abram, and his wife, Sarai. Though they had great flocks and herds they were sad, for they had no child. The Lord appeared to Abram and told him to go away from his country into the land of Canaan and promised that he would make of his descendants a great nation.

Abram obeyed and removed to the country we now call Palestine. We cannot tell here all the occurrences, but you can find the story in the Old Testament. Abram was promised a son and told to call himself Abraham and his wife Sarah. The son was born and called Isaac. He married his

cousin Rebecca and they had two sons, Esau and Jacob, later called Israel. The latter secured the greater part of his father's property by a trick, and married his two cousins, Leah and Rachel. He had twelve sons. One of these, Joseph, his father's favorite, was sold into Egypt as a slave by his jealous brothers, who did not like the way their father favored him; and there, because of his wisdom, he finally became First Minister and the real ruler of Egypt. After a time, because of famine, Jacob and all his sons and their families were moved to Egypt, where land was given them, and where they increased greatly in numbers.

Years afterward, the Egyptians became jealous of them. The rulers inflicted many hardships upon them, though they would not let them go out of the land. At last a great leader, called Moses, arose, and the children of Israel determined to leave Egypt and seek the land promised to Abraham. Finally they were allowed to go, and left Egypt, but for forty years remained in the Wilderness between Egypt and Palestine, where the Lord appeared several times to Moses and gave him laws for the people. The Bible says that the Ten Commandments were given to Moses in this way.

#### HOW THE CHILDREN OF ISRAEL CAME TO THE PROMISED LAND

After the death of Moses, a brave and skilful general, named Joshua, led them into the "Promised Land," where they contended for possession with the heathen tribes, sometimes conquering, sometimes losing, but always increasing in numbers. A tabernacle for worship was set up and priests were chosen to offer the sacrifices. To this period belonged Gideon, Samson and the prophet Samuel. After a time they decided that they must have a king, and Saul was chosen. One of Saul's lieutenants was a young man, David, who had become prominent because, while a young shepherd boy, he had succeeded in killing with a sling and a stone the great champion of the Philistines called Goliath.

Saul became jealous of David and several times sought his life. Finally David and some companions rose in rebellion against Saul and were able to conquer part of his territories. Saul and his sons were slain in a great battle with the Philistines, and soon after David became king of Israel. There was much fierce

fighting for a time, but at length the heathen tribes were forced to obey and the kingdom grew more powerful.

#### SOLOMON, THE WISE KING WHO BUILT THE TEMPLE

Many interesting events occurred during David's reign, but we cannot stop to tell them now,—not even the sad story of Absalom, his favorite son, who rebelled. At the death of David, his son Solomon became king, and under him the kingdom reached its greatest wealth and power. He built at Jerusalem a magnificent temple for the worship of the Lord; he sent ships to every port of the known world, and built great public works. The fame of his wisdom reached the ears of far-away rulers, who came to talk with him.

All of Solomon's great works cost much money, however, and at his death the people hoped that their taxes might be lightened. Solomon's son, Rehoboam, who succeeded him, was a proud and arrogant young man with high ideas of the power of a king, and threatened to make their lot harder. Under Jeroboam, the northern part of the kingdom revolted and became the independent kingdom of Israel, leaving only the southern part, including Jerusalem, called the kingdom of Judah, faithful to Rehoboam. This division took place, as we count time, somewhere between 975 B. C. and 930 B. C., that is, between twenty-eight hundred and twenty-nine hundred years ago.

#### THE FALL OF THE NORTHERN KINGDOM OF ISRAEL

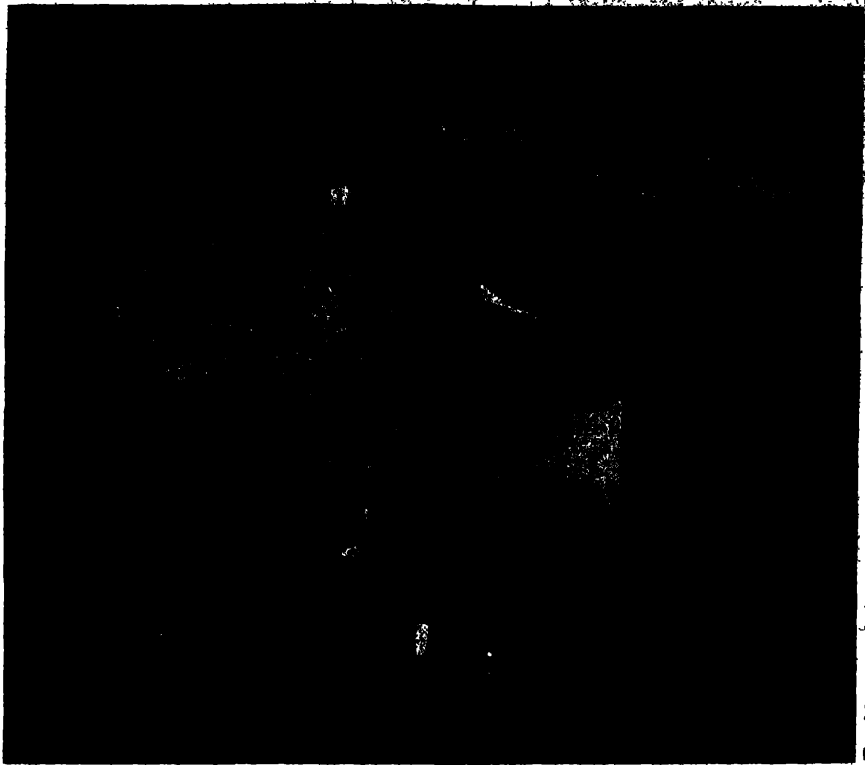
For about two hundred and fifty years, the story of the two kingdoms is not a happy one. Many of the rulers were bad, some were idolaters, and there was much fighting. Sometimes the two little kingdoms were at war with each other and sometimes with the stronger nations about them. Egypt and Assyria at times demanded tribute, and finally, about 721 B. C., Sargon, who had been a general of Shalmaneser, ruler of Assyria, and who succeeded him, captured Samaria, the capital of the northern kingdom, and carried away many of the inhabitants to his own country, though some were allowed to remain.

What became of those who were carried away, no one can say, though some men have tried to prove many curious things. Some have said that these "Ten Lost Tribes of Israel" somehow came to America and became the ancestors of

## WHERE THE GREAT TEMPLE OF SOLOMON STOOD



Solomon built a strong foundation for the temple on Mt. Moriah. Now the spot is occupied by a magnificent Mohammedan mosque, shown in the centre of the picture. Other smaller mosques stand on the great raised platform. Ruins of the Great castle built by the later kings may also be seen in the neighborhood.



To this part of the great foundation wall of the platform built for the temple Jews living in Jerusalem come every Friday to worship the departed spirit of their holy city. Nearly two-thirds of the inhabitants of Jerusalem are Jews, and the government was for hundreds of years entirely in the hands of the Jews.

our Indians; some have thought that perhaps the Japanese are their descendants; some have thought that the Irish come from them; and many other theories just as absurd have been taught. It is probable that, in their scattered state, they mingled with the people with whom they lived and finally lost their religion and forgot their ancestors. Their lands were taken by colonists sent out from Assyria.

#### THE SOUTHERN KINGDOM IS FINALLY DESTROYED

The kingdom of Judah endured for more than a hundred years longer, though for a time it was dependent upon Assyria and then upon Egypt. Some of the rulers were bad men and the people often fell into the worship of the heathen idols such as Baal and Ashtoreth. One great king, Josiah, restored the temple, and for a time things were more hopeful. The prophet Jeremiah, however, said that trouble was coming and warned the people to repent thoroughly of all their sins. Finally, about 606 B. C., Nebuchadnezzar, king of Babylon, which was now the great power in the East, conquered the country, though he allowed the king to remain as his vassal. Many of the wiser Jews, among them the great Daniel, were sent to Babylon to serve the king. Soon the people revolted, and in 586 B. C. Jerusalem was captured and many of the inhabitants were taken to Babylon. The governor whom Nebuchadnezzar had left in charge was killed by a member of the old royal family and many of the remaining Jews fled to Egypt.

#### EZRA AND NEHEMIAH TRY TO BUILD UP THE KINGDOM AGAIN

In Babylon many of the Jews became important people, and after Cyrus, King of Persia, had conquered the city, he was persuaded to send those Jews who wished to return, to Jerusalem. This was 536 B. C., seventy years after the city had been taken. Later another large company, under Ezra, returned to their old home and soon Nehemiah, a pious Jew, but a favorite of the Persian king, was made governor. Esther, a young Jewess, even became the wife of a later Persian king.

Then for a long period the little province was tossed back and forth among the kings who rose to power. It was taken by Alexander the Great, who granted the inhabitants many privileges. After his death, when his great empire had fallen

apart, hapless Judæa was a cause of quarrel between Egypt and Syria, for more than a hundred years. Many Jews went to Egypt to live, and some rose to high position. From the time that Joseph went down into Egypt there had been much intercourse with the Egyptians, and many traders passed back and forth.

Finally Judæa fell into the hands of Antiochus of Syria, who massacred many of the inhabitants and sold others as slaves, and defiled the temple. Their persecution became more than they could bear, and under Judas Maccabeus, a wonderful general, they almost freed their country from foreign tyrants. Unfortunately he was killed in battle, and the work was completed by Simon, his brother, and in 141 B. C. Judæa again became independent. For a time there was peace and prosperity, but divisions arose, and the great Pompey, of whom you may have read in the history of Rome, captured Jerusalem and carried many Jews to Rome. When Pompey fell before the power of Julius Caesar, the latter made the Idumæan Antipater, a foreigner, ruler. Then his son Herod became "King of the Jews" by the vote of the Roman Senate.

#### HEROD, THE GREAT KING OF THE JEWS

His rule was hateful to the Jews, even though he married a princess of the old line, but his strong arm and great ability enabled him to maintain his power in spite of all his enemies who carried many complaints about him to Rome. When his troubled, stormy life was over, by his will he divided his kingdom among three of his sons. The one to whom Judæa was given was hateful to the people and the Romans took control, though Herod's descendants had a shadowy rule over some of the provinces for a hundred years longer.

During Herod's reign, Jesus was born in Bethlehem, and under the Roman governor, Pontius Pilate, was put to death, but his disciples preached his doctrines and slowly his followers grew in number. At first they came from the Jews, but after Paul became so prominent among them, they admitted outsiders (Gentiles they called them). Fierce disputes between the Jews and the new sect arose, some of the Roman rulers were tyrants, and in the year 66 A. D. the Jewish war broke out.

## HAMAN MEETS HIS DOOM AT A FEAST



MORDECAI AT THE KING'S GATE REFUSES TO DO HONOR TO HAMAN



ESTHER INVITES THE KING TO A FEAST AND DENOUNCES HAMAN

Because he hated Mordecai, the Jew who sat at the king's gate, Haman plotted to destroy all the Jews in the kingdom of Ahasuerus, whose Prime Minister he was. Queen Esther, who belonged to the Jewish race, and had been brought up by Mordecai, heard of the plot of Haman and invited him to a royal feast. Haman went to the banquet, but first of all built a high gallows, meaning to ask the king to hang Mordecai upon it; but at the feast the queen denounced the Minister before the king, who ordered Haman to be hanged on the gallows he had prepared for Mordecai. Mordecai took the place of his old enemy, and so was able to protect his people.



**JERUSALEM IS DESTROYED BY THE  
ROMAN POWER AFTER A FIGHT**

The Roman emperor, Nero, sent his best general, Vespasian, to put down the rebellion. Terrible fighting followed, but before Jerusalem had fallen, Vespasian became emperor and left his son, Titus, to complete the work. Titus closed around the doomed city, but its defenders fought desperately. There was no food, the soldiers on the wall were so weak from hunger that they could hardly stand. All, men, women and children, struggled to keep out the invaders, but finally the walls were broken down, the Roman soldiers entered, the temple was destroyed and the captives who were left alive were sold as slaves. This was in the year 70 A. D.

**JUDÆA DESTROYED BUT MAY  
RISE AGAIN**

Thus perished Judæa and it has never been restored. The Roman Empire was divided, and became weak, and the land has been held since first by the Persians, and then by Arabs and Turks. During the Crusades it was for a little while ruled by Christian princes, but the Turks soon regained control. In 1917, during the Great War, Jerusalem was captured by the English, and many Jews hope that a Jewish state will again be set up after the centuries that have passed since it was destroyed.

Other countries have gone in much the same way. Assyria, Chaldea, Babylon are now but names. All that is left of them is contained in a few records which the wise men try to read. Their people were swallowed up and soon forgot the glories of the past.

**WHY HAVE NOT THE JEWS  
DISAPPEARED AS A PEOPLE?**

Here is the strange, the wonderful difference between Judæa and all the rest. The kingdom of Judæa was destroyed, but the Jews are a vital force to this day. Never in history have there been so many of them, never have they been so influential and so powerful as to-day. What is the reason for this marvelous difference?

Some wise Jews say that the long captivity in Babylon is partly responsible. Before this time they had often forgotten the Lord and turned aside after strange gods; they forgot the Law of Moses, and neglected their religious duties. In Babylon they were in a strange land. Though many succeeded in business and others

held high places in the state, they felt that they were strangers. Their religion, the fact that they were Jews, the "chosen people," became more and more important. They thought about it, talked about it, and the feeling grew stronger. The rules of conduct grew stricter and they took a pride in obeying them. Learned men discussed the Law, "The Torah," and the interest in all the sayings of the great teachers became intense.

Not all the Jews in Babylon returned to Jerusalem: many remained there, and as business called them, traveled to different cities and settled there. What is known as the "Dispersion," that is, the scattering, began, and has never ceased to this day.

**HOW THE JEWS WERE SCATTERED  
OVER THE WORLD**

After Jerusalem was destroyed by Titus, most of the inhabitants were taken by their new masters to Italy or to the Roman colonies in France and Spain. Permission was given, however, to a famous rabbi or teacher, Johanan ben Zakkai, to open a school at Jabné, or Jamnia. From this school went out many teachers, all of whom worked to make all Jews feel that nation and religion were one, that all were brothers no matter how widely scattered. There were other schools at Babylon and Alexandria, for example, and all did their work well.

They did not give up their hope of again gaining Jerusalem, and several times strove fiercely in arms against the Roman power, which did not at first treat them so harshly as might have been expected. When Christianity became the state religion of the Roman Empire under Constantine, as you may read elsewhere, their lot became harder, except as their wealth protected them. The Mohammedan power was generally friendly, and in Spain they became very important. Jewish physicians were believed to be the most skilful, Jewish traders and bankers were the favorites at many courts, and Jewish scholars and teachers were the companions of the wisest. Finally, however, they were forced to become Christians or else leave Spain.

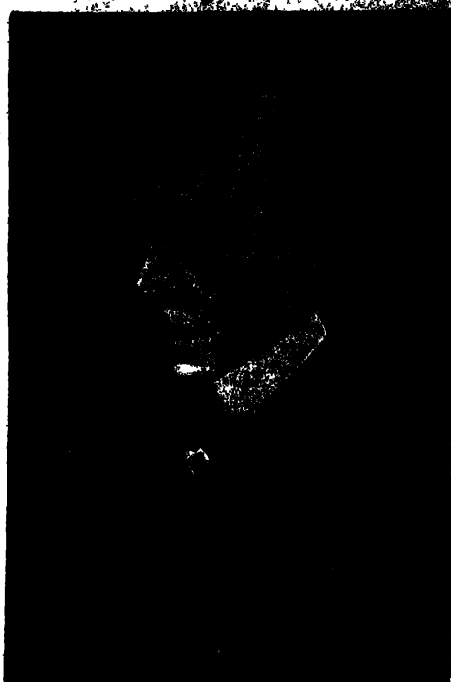
**THE TALMUD, WHICH GUIDES  
JEWISH LIFE**

When they were forced to leave Spain and Portugal, they went to Holland, Italy or Turkey. For a time the princes of Germany protected them, but as persecu-

## FOUR WORLD-FAMOUS JEWS



Felix Mendelssohn-Bartholdy was one of the most popular musicians of his time, and his compositions are still much admired. He was a grandson of Moses Mendelssohn, the great reformer.



Benjamin Disraeli was, for a long time, Prime Minister of Great Britain and was raised to the peerage as Lord Beaconsfield. He also wrote many novels and was a brilliant talker.



Judah P. Benjamin, of Louisiana, was a Senator of the United States, and then a member of the Confederate States Cabinet. After the Civil War he went to England and became one of the most successful lawyers in London.



Sir Moses Montefiore was one of the greatest philanthropists the world has ever known. He used much of his great wealth for those less fortunate than himself, but always gave wisely. Evidences of his generous gifts are seen in every country.

tion grew harder, many went to Poland, which was most liberal in its treatment of them though even there they suffered much. Their sufferings, however, only made them cling more closely to the Law, and the explanations of it, comprised in their sacred book called the "Talmud." Many studied nothing else, just as some Christians have said that it is useless to have any knowledge not contained in the Bible, and strict Mohammedans refuse to study any other book than the Koran.

During the Middle Ages the lot of the Jew was very hard, but as men have grown wiser they have recognized the fact that it is both foolish and wrong to persecute a man for his religious beliefs. In the most enlightened countries the laws which were unfair to the Jews have nearly all been repealed. In all English-speaking countries they have equal rights with all other citizens.

#### HOW SOME COUNTRIES STILL PERSECUTE THE JEWS

In Russia, however, which has included much of the old kingdom of Poland, where there are more Jews than anywhere else, conditions have been very little better than they were in all Europe five hundred years ago. They have not been secure in the possession of their property, right of travel and settlement except in certain localities has been denied them, and only a small number have been allowed to attend the schools. We shall all watch with interest to see what the new governments of Russia will do for the Jews.

It is a general rule that the more backward a country is in civilization, the more harshly it treats the Jews, or, for that matter, the stranger within its territories. Those countries which are free themselves are willing for others to be free. So it is the states of Eastern Europe, which have had tyrannical governments, which show the most harshness.

During the Middle Ages and afterward the Jews were often forced to live in a particular neighborhood and to wear a special dress or, at least, a yellow badge, so that they might be recognized at once. All of this had its effect upon them, and we cannot wonder that their eyes were always turned backward, and that they lived in the past. One great man, Moses Mendelssohn, is given the chief credit of waking his fellows from their slumber. By his writings, his addresses and his

personal influence he started a movement which has made the Jew a citizen of the world.

For a long time all the Jews observed the Law very strictly, though there were some differences among the different sects. After Moses Mendelssohn, however, a party known as the "Reformed" Jews arose. These say that all the different points in the Law do not fit modern life, and so they have omitted many of the ceremonies which the "Orthodox" Jews observe. They cling, however, to the principal things, and have many synagogues in the principal cities of Europe and America. There are also "Conservative" Jews who take a middle course.

#### WHAT SOME OF THE EUROPEAN JEWS HAVE DONE

To name the great men and women of Jewish blood who have accomplished so much would take a long time and occupy many pages of our book. Therefore we can name only a few, not always the greatest, but some of the most interesting.

Music is an art in which those of Jewish blood have been prominent. Mendelssohn-Bartholdy, who wrote the "Wedding March" so often played, was the grandson of Moses Mendelssohn, mentioned above. Rubenstein, the great pianist, Meyerbeer and Offenbach, the composers, and Joachim, the violinist, as well as hundreds of other composers, performers and singers, have shown the Jewish talent in this art. Two of the greatest actresses of Europe, Sarah Bernhardt and Rachel, were both born Jews, and many artists are of the same race.

In France and Italy Jews have been ministers of state, but the most interesting of all was Benjamin Disraeli, afterward Lord Beaconsfield, who rose to be Prime Minister of England. Something of his life is told in another place. But though Disraeli was of the Jewish race he did not follow the religion, but became a Christian.

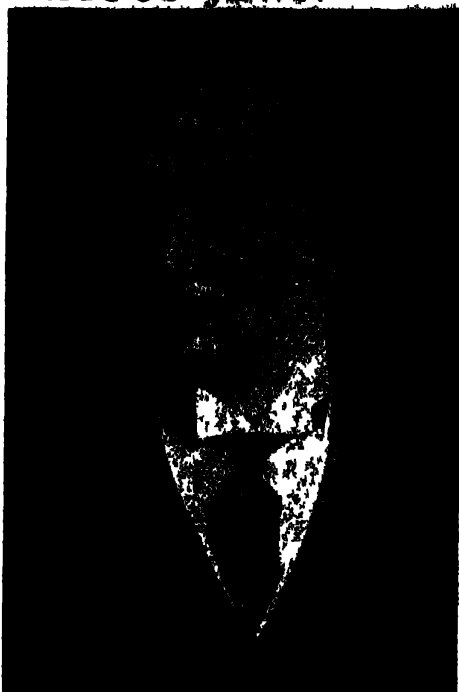
#### THE MOST POWERFUL BANKERS IN THE WORLD

Lionel Nathan Rothschild, a member of the great family of bankers which has been powerful in several European states for a hundred years, was the first Jew elected to the English Parliament. Though refused at first, the city of London continued to elect him until the law was changed and he was admitted. His son, Nathan Meyer, was made a member

## FOUR OTHER FAMOUS JEWS.



Oscar S. Straus has been three times Minister to Turkey, Secretary of Commerce and Labor, member of the Court of Arbitration at The Hague, and Chairman of the Public Service Commission of New York



Earl Reading, who was made Lord Chief Justice of England in 1913, while plain Rufus Isaacs gained great renown at the law. He has also been Solicitor General and Attorney General of England



Louis D. Brandeis studied law at Harvard and practised in Boston, gaining a wide reputation. He was appointed a Justice of the Supreme Court by President Wilson



Felix Adler was born in Germany, but came to the United States as a child. He founded the Society for Ethical Culture, and also lectures at Columbia University

Pictures by Brown Bros., that of O. S. Straus copyright, 1906.

of the House of Lords in 1885, the first Jew to be created an English peer. Several Jews have been members of the British Cabinet and in 1913, Sir Rufus Isaacs, now Earl Reading, was made Lord Chief Justice of England.

While the Jews in Germany have not held so many governmental positions, they have surpassed those of any other country in scholarship, and in literature. Some of the greatest scientists, the most learned historians, and most noted scholars have been Jews. One of Germany's greatest poets, Heinrich Heine, was born a Jew.

We must not forget Spinoza, the Jewish philosopher of Amsterdam, nor Sir Moses Montefiore, who gave a great fortune to help his unfortunate fellows, nor David Ricardo, whose book on political economy, which is the science of wealth, is studied in every university. The socialist, Karl Marx, was also born of Jewish parents.

These are only a few out of thousands who might be named, but they are enough to show how talent and genius will gain fame in spite of prejudice and harsh laws.

#### THE JEWS IN NORTH AND SOUTH AMERICA

It is said that some of the members of Columbus' crew were of Jewish blood, and some of the earliest settlers of the Spanish and Portuguese colonies were Jews. They were particularly numerous in Brazil, where they became very wealthy. From Brazil came a little colony to New York, or New Amsterdam, as it was then called. This city is now the greatest Jewish city in the world, as it is estimated that nearly 1,500,000 of them now live in or around New York. Before the Revolution there were a few Jews in nearly all the original thirteen colonies.

The persecutions in Russia, together with the hope of bettering their condition, have brought many thousand poor Jews to the United States. Here they have settled chiefly in a few large cities, where they often work hard for small wages, and are too much crowded for health. Nevertheless their condition is steadily improving, and many are becoming prosperous. The Jews who came from other parts of Europe years ago, and their descendants, are nearly all successful.

The Jews in the United States have taken, and are taking part in every form

of work. Among them are distinguished inventors, lawyers, physicians, writers, actors, scientists, musicians, artists, scholars, and successful business men, as well as mechanics, workmen and traders.

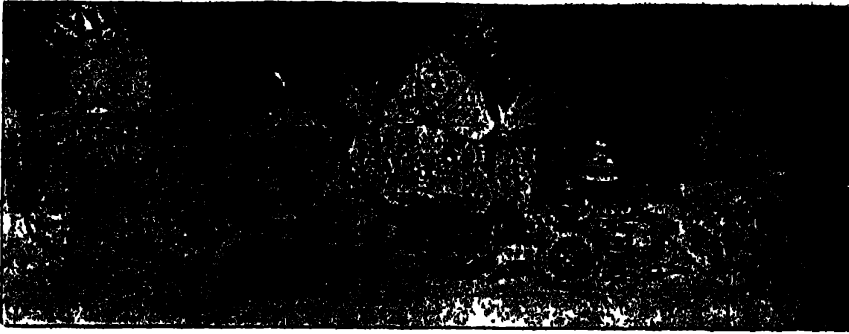
#### SOME OF THE POSITIONS HELD BY THIS WONDERFUL PEOPLE

Some of the most noted lawyers and judges are Jews; several have served in the United States Senate and about thirty in the House of Representatives; some have been governors of their states; some have served with credit in the army and navy; one, Oscar S. Straus, has sat in the President's cabinet; and another one, Judah P. Benjamin, once United States Senator, was a member of the Confederate cabinet during the Civil War. Justice Louis D. Brandeis, of the Supreme Court of the United States, is a Jew. Some of our most learned college and university professors are of Jewish blood. They write books, edit newspapers, manage theatres, write plays. In short, they have a great share in the intellectual life of the country.

In business they are no less successful. Some of the most important banking houses in the great cities are controlled by Jews. The manufacture of clothing is almost entirely in their hands, and they are also largely engaged in other kinds of manufacturing. Some of the largest department stores in the great cities are owned and managed by Jews.

They are liberal givers to charity and education. They maintain orphanages for homeless children, homes for the aged and afflicted, and some of the best equipped hospitals in the country have been built by Jewish money. They have organized societies to take care of the ignorant immigrant, and to help him when work fails or sickness comes. Many Jews observe the old rule of Moses which declares that a man must give a tenth of his income to religious and charitable purposes.

The desire for the education of his children is one of the most amazing and hopeful features in the life of the Jews in the United States. Coming from countries where education was denied them, they flock to the schools in the United States. While many go no further than the grammar schools, a very large number continue in the high schools, college and universities, and often carry away distinctions from their Christian companions.



## THE FIRST APPLE DUMPLING

THE princess was looking up at the apple-tree, when—  
plop! down fell an apple at her feet!

It was not a common, ordinary apple, or it would not have been growing there, but a golden pippin.

"Oh dear!" said the princess, picking it up. "I hope you haven't hurt yourself."

"They dared me to do it," said the apple—the other apples, you know. They said I should be afraid to let go my stalk and jump. And I just held my breath and counted one, two, three and jumped. And now I *have* done it, I'm sorry, for someone will want to eat me, and I am not nearly ripe enough!"

"I will hide you," said the princess.

And she ran into the palace to look for a hiding-place. But whenever she opened a box or a cupboard the apple cried, "That won't do. Someone will be sure to find me there!"

The princess went all over the palace, upstairs and down, looking for a safe hiding-place for the apple: and at last, feeling quite exhausted, she came to the kitchen. The chief cook was rolling out paste with a golden rolling-pin to make a roly-poly pudding with golden syrup in it for the princess's dinner.

The princess was still looking about for a hiding-place when one of the silver saucepans boiled over, and the chief cook left off rolling the paste to

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attend to it. The instant his back was turned, the princess took some paste and wrapped the apple up in it.

"No one will think of looking for you there," she whispered.

Then she saw that the door of an oven, out of which a cook had just taken a tray of tarts, was open, and she popped the apple in, to hide it twice over.

"Dear me, what is this?" asked the king at dinner, as he caught sight of a round brown thing on a dish.

"I don't know, your Majesty," was the answer. "The chief cook said he found it in the oven, but he thought your Majesty would find it very good to eat."

"Give me a knife, and I'll see."

"My dear," said the queen, "pray be careful. Suppose it should go off suddenly and blow us up!"

"Pooh!" said the king boldly. "Who's afraid?" And he cut it in two with a single stroke of the knife.

"Why," he said, "it looks like an apple. And yet it can't be. For how could an apple get inside—"

"Papa," put in the princess, "I think it must be the apple I had. It wasn't ripe and was afraid someone would eat it. But perhaps it won't mind so much now it is cooked."

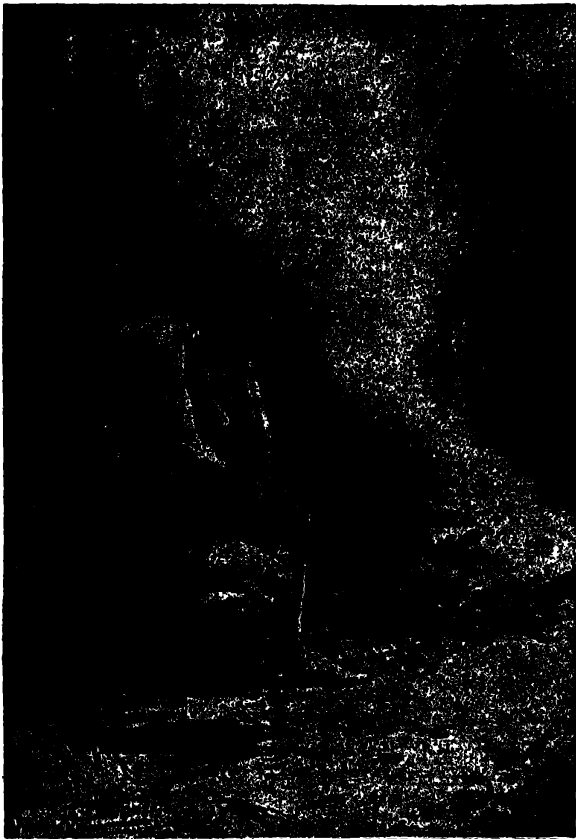
The next day the king asked the princess to show the cook how to hide some more apples. And that is how apple dumplings were invented.

# THE FIRST HOME, SWEET HOME

## A TALE OF A HUNDRED THOUSAND YEARS AGO

AFTER the wild dog pack swept all the animals from the land around the Thames, Wawa and his tribe had bad living. They were hunters who fed chiefly on meat. They did not know how to till the soil and grow food, and were compelled to live on acorns and wild fruit.

Swar did not like acorns at all.



WAWA SAT THINKING HOW TO KEEP UP THE FIRE

"This is pigs' food," he said; one day, to his father. "Even my dog will not eat it!"

"He'll eat it," said Wawa impatiently, "when he is starving like the rest of us."

But the strange thing was that Swar's little dog never seemed to get hungry. The men were weak and the women sad and the children thin and pale. Wawa sat by the great camp fire on Cornhill, trying to think how he could get meat for the tribe to live on. Like his people,

he was very lean and worn, and he was losing his wonderful strength of arm.

"I am afraid, my little son," he said to Swar, "we must tramp back and see if the terrible dog pack has left any game there. We shall starve if we stay here much longer."

He rose up wearily to examine the trees and make plans for building a huge raft. The Thames in those days was a wide swirl of water resembling the Amazon and the Mississippi. Instead of flowing into the sea, it ran into the Rhine. It was more by chance than by skill that the tribe had crossed the river safely in the summer; and now that it was swollen with autumn rains, it seemed impossible to return.

"Still, we must risk it," said Wawa, speaking round the camp fire that evening to all the tribe. "It is clear that if we stay here we shall perish. The wild dog pack may return and destroy us. Remember how hard we found it to beat them off before, and they will be even more savage this time. Even if we escape that danger, we shall not live through the winter, with nothing growing on the trees, and no game in all the forest."

As he spoke, the little dog came running through the jungle with something in its mouth. Terror, as he was now called, dropped what he carried at Swar's feet, and then looked up in the boy's face, waiting for a sign of approval.

"By all the glory of the sun," shouted Wawa joyfully, "the little Terror has saved us! Look, he has brought good meat!"

"Hunting! Good hunting!" shouted the tribesmen.

Wawa held up a dead rabbit. Being hunters of big game, he and his men had only searched the jungle for the tracks of deer and of wild sheep and oxen. The night raid of the dog pack had killed many rabbits, and those that

remained dared not show themselves in the daylight. Terror had hunted them by scent in the darkness. Having made a good meal, he had killed for his companions, and brought his kill to Swar.

Terror was furious when Wawa seized the rabbit and held it up for the tribe to see. Leaping up with a snarl, he dragged the animal out of the chief's hand, and again laid it at Swar's feet, and then stood by, growling, ready to attack anybody who tried to rob his master of the spoil.

Wawa roared with laughter, and stooped and patted the faithful dog.

"Well done, Terror!" he said. "After all, Swar is your chief, and you owe your life to him. He shall have the rabbit, and we shall all profit by the lesson you have given us. You have managed to keep fat and strong on rabbits, and so may the tribe."

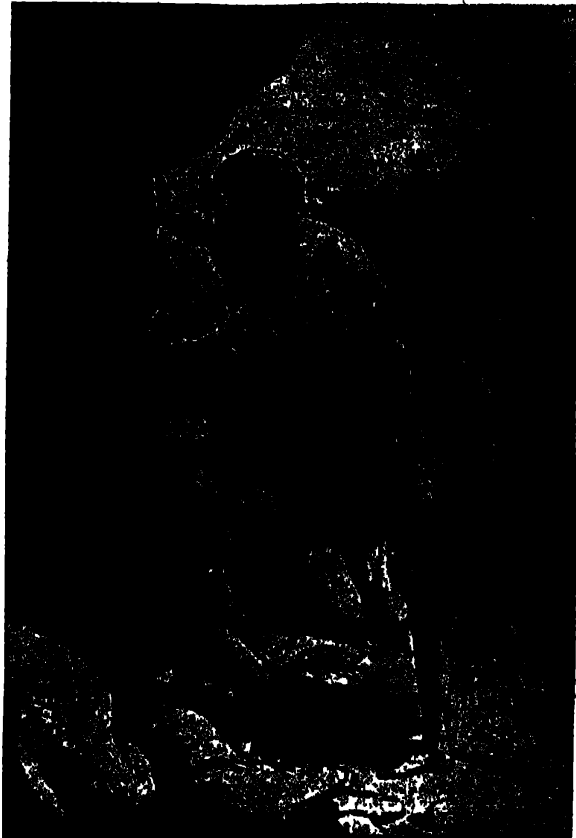
All thought of re-crossing the mighty river was now given up. The young tribesmen were soon busily engaged in searching for rabbits. The older men made a temporary camp in a flint quarry, and chipped some of the smaller flints into small rough stone knives, sharper-edged than the great stone axes they were accustomed to use. Then the women, taking the new knives, with infinite care, cut the skins of their tents into thin strips of leather, and with these made a great number of snares, which were placed over all the rabbit holes found in the forest.

Thus the tribe at last managed to get food as winter was coming on, when fruit of all kinds was becoming rare. Unfortunately, all the tent skins had to be used in making the snares, and when it began to rain heavily, life in the camp became very uncomfortable.

There were days when the great tribal fire was almost put out by the continual downpour, and Wawa became very anxious. In those days there was no one who knew how to kindle a fire. Men had not discovered how to make a flame. It was from rare forest fires and from distant volcanoes that the

tribes obtained the blaze they guarded so carefully.

Wawa had carried his precious fire all the way from France, and had built rafts to carry it over the rivers the tribe crossed on their strange journey into the unexplored jungles of England. Now he sat thinking vainly for hours of some means of preserving the sacred camp fire from being put out by the



"WE WILL FIGHT FOR THE CAVES," SAID WAWA

unceasing torrent of rain. If it were allowed to go out, it would be weeks—even months—before they could get it again.

Wawa was a very wise man—one of the wisest men who ever lived in any period of the history of the world. He was only a savage, ignorant of everything on which our own civilized life is based. No savage in the wildest country at the present day is as wild as he was. He and his people clad themselves in skins which they could not even roughly sew together. Several thousand years had to pass before men learned how to make a rough needle by



boring through a small wing-bone of a bird. Another vast period of time then followed before men discovered how to sow grain and gather it and store it. There are some ants—farmer-ants they are called—that do this. But no man in Wawa's time was as wise as these ants.

And yet, though he lived in that far-off time, Wawa was a man of genius. He could invent new things. It was by the slow and painful efforts of men of his sort that mankind gradually improved its way of living. Wawa first tried to protect his fire from the rain by building over it a rough shelter of leafy boughs. But the shelter was so badly built that the wind blew it down, and, in falling, it almost put out the dying fire.

"So that won't do!" said Wawa angrily.

Not knowing how to sew, he could not make new coverings out of rabbit-skins, and again for some hours he sat

by the flickering fire, puzzling his brains. He did not go to sleep that night.

"Come with me, Swar," he said to his little son, at daybreak, "and bring your dog with you. I want to explore that hill where I found you with the lioness."

Nothing stirred in the jungle, and when they came to the northern height, they found that that too was deserted. The wild dog pack had swept the caves in the hillside free from the huge beasts of prey that used to dwell there.

"The great beasts will come back," said Swar, "won't they, Daddy?"

"Yes, my son," said the chief grimly. "They'll come back when the deer and the other game return. But they will find their caves occupied. Then we will fight for the caves, and see who is master, man or the animals!"

That was how, thousands of years ago, man first made a home in a cave.

## WHEN THE FIRE WENT OUT

OUTSIDE the largest of the caves on the northern heights of London, a little boy, clad in a lion skin, was hammering at a flint with a stone axe. All around stretched the rank, green jungle growth. Over the tops of the sycamores and fig-trees the Thames could be seen, a great breadth of shining water, nearly a mile broad in places, with a terribly swift current. The rains had begun, and the river was filling up from all the little streams from the hills. It swept into the Rhine. This was thousands of years ago.

"Look at the fire in the stone!" cried the little boy to his father, as with his stone axe he struck sparks out of the flint. "Oh, look at the fire in the stone!"

A broad-shouldered man, a mane of red hair falling over his back, and a great red beard and moustache almost hiding his face, came out of the cave, laughing. He was Wawa, the chief who had led his tribe across the river which divided France from England.

"So you have found out, little Swar," he said, "that there is fire magic in stones. All the tribe knows that, my little son."

"Then why don't you make a fire with it?" said Swar.

"We can't make fire out of magic,"

said Wawa rather sadly. "Not even the greatest wizard can do that. By the flaming sun, I wish we could get fire from the stone, now that the rains are setting in! The woods are all so wet and we cannot get enough firewood under cover in time."

And he went back slowly into the great cave to see that the tribal fire was burning well and bright. In those distant days man had not yet learned how to make fire. Here and there a tribe had found a forest blazing in a summer drought, and, snatching some flaming branches, had made a fire. In other places, far to the south of Europe, fire had been got from a volcano. It was the thing which the poor ignorant savages valued most. It was the only thing they possessed which the beasts had not.

On the young unmarried girls of the tribe fell the duty of feeding the fire night and day, and keeping it alight. The tribesmen used the fire to harden and sharpen the wooden spears with which they did most of their hunting. After being charred, the ends of the wooden sticks were scraped with sharp flints. It took a week to chip into shape a great stone axe, while with a fire a wooden spear could be made in a minute or two; so these spears only were employed in ordinary hunting where

every tribesman needed several in a day's hunt.

Swar, who had just reached his seventh year, had resolved to attack nothing smaller than a mammoth. There were several of these huge, wooly elephants in the jungle which stretched between Hampstead and the Thames; and two days before, while Swar was squatting by his father's side near where Camden Town now is, he had caught a glimpse of one of the great beasts.

In serious, childlike fashion he went on hammering at the big stone which he wished to make into an axe. Sometimes he hit the stone; sometimes he hit his fingers. There was not enough strength in his little brown hands to strike the least bit off the great flint. Terror, the wild dog which he had found when a puppy, and trained, kept frisking round him, and trying to get him to play. But for some time Swar vainly went on with his work. He had seen two tribesmen making a tremendous stone axe for his father, and naturally he, too, wanted to make one for himself.

Suddenly he was interrupted. A young tribesman came running at full speed up the hill, breathless and wild with excitement.

"Deer!" he shouted. "A great herd of deer down by the river!"

Out of all the caves rushed a crowd of joyous men and women and children. Winter-time was at hand, and the tribe had not seen any big game for months. The rabbits had saved their lives, but rabbit-flesh palls.

"Seven spears for every man!" cried Wawa, in a loud voice. "And down to the water at once! Women and children all follow, and help to bring the meat home!"

Then Bina, his wife, spoke.

"But some one must remain at home to tend the fire," she said.

"Well, let the youngest children do that," exclaimed Wawa. "You know how we had to starve all the summer. It may be worse in the winter if the dog-pack returns and sweeps the jungle again, and it is likely they will scent the deer."

"Yes, yes!" shrieked all the tribesmen, dancing in excitement, and waving their spears above their heads. "We cannot lose a single deer. Leave one of their bodies for a minute, and a wolf

or hyena will get it. The chief is right. All the women must come with us."

Wawa was already running down through the jungle at a hard, steady pace. His men whooped, and then followed him silently and swiftly; and the women and girls and older boys went after the men.

Bina stayed behind for a minute, and talked to her little son.

"Now, Swar," she said very earnestly, "you must be a great chief like your father, and see that all the children keep the fire burning. Make them bring a lot of branches and put them all carefully on the flames."

"Very well, mother," said Swar proudly. "You'll see, I'll make the biggest fire in the whole world."

When his mother went away it began to rain heavily. But this did not daunt Swar. It was the first time he had been set in authority, and he was resolved to astonish the tribe by his magnificent work. He kept the children for hours running out into the jungle, and tearing down wet, dripping branches. When they could not reach the branches themselves they grasped and tore off armfuls of wet leaves. At last a big mass of soaking leaves was built above the fire, and Swar was still keeping the children busily employed, when the tribesmen came tramping back with the spoils of the hunting.

Wawa dropped the two deer he was carrying when he saw what his little boy had done.

"By all the splendor of the sun," he cried, in a wild voice, "what have you children done to the fire?"

He began to tear away the stack of wet leaves. Quickly the men saw what was the matter, and so did the women. Shrieking with fright, they, too, tore at the wet green stuff, and at last pulled it all off the hearth. But it was too late—the rain-water had completely put out the fire. Where it had been, there was now only a pool of dark mud.

In the darkest corner of the cave crouched Swar, sobbing as though his heart would break. His father was too upset to be angry with the little boy. The loss of the fire was the most terrible disaster which could have occurred to a tribe. It left them open to attack from the most cunning and the most savage of all the wild beasts—the huge cave

bear and the huge cave lion, who were certain to return now that the deer were by the Thames. At first Wawa thought it would be safer to camp out in the jungle; but it was still raining heavily, and the tribe now had no skin tents. They had used all their skins in making snares.

"Well," he said, at last, "the women and children must sleep together in this big cave, and the men must take turns in keeping awake at nights and watching over them."

"You sleep, too, chief," said one of his men. "You must be more tired than any of us."

"No, I will help you keep watch," said Wawa wearily. "I cannot sleep. I must think of a way," he added. "Oh, if only there was a tribe from whom we could borrow fire!"

But there was no other tribe within a hundred and fifty or two hundred miles.

Weeks must elapse before a fire messenger could go and return.

"It will be necessary," thought Wawa sadly, "to go back across the river."

As he was considering whether he should wait till the meat was cured, or lead his tribe away at daybreak, a cold wet little figure came and nestled up to him.

"Father," said Swar softly, "couldn't we get some of the magic fire out of the stone?"

Wawa shook his head. He looked down at the ground, thinking of other things, and his eyes idly rested on a heap of dry leaves in a corner. The dawn was just breaking.

"That's it!" cried Swar, following his glance. "Let us set light to the leaves with the fire in the stone."

Sitting among the dry, withered stuff, he began eagerly to strike fire from the flint. It was easy work after making an axe, and being chief of all the children. His father watched him listlessly. Suddenly he started up with a cry of joy, and, taking the stone and the flint axe from his little son, he began to strike them together quickly and lightly and steadily. He had seen a spark burn a tiny hole in a very dry leaf.

Half an hour afterwards the men and women and children were awakened by a wild, shrill, strange song. Wawa was dancing about the cave, singing and holding Swar above his head. In a corner was a little smoking heap of leaves and twigs. Man had made the great discovery—he had found out how to make a fire.

## HOW THEY GOT A HOLIDAY

SOME schoolboys, who had failed to obtain a coveted holiday, thought of a plan for getting the schoolmaster out of the way.

"If we could only get him to think he is ill," said the eldest of them, "he would be ill"—which was perfectly true. So they arranged that, as they entered the school the next day, each one should say to the master:

"Good-morning, sir! I am sorry to see you looking so ill."

The schoolmaster replied, "Ill? I'm sure I don't feel ill."

But when others made the same remark, after a little he shut his book, and said he would return home.

So the boys got the wanted holiday. But the next morning they were surprised to find nobody at the school.

"The master must be really ill," said the boys. "We had better inquire."

A deputation started out and on the way they met a man, who told them that the schoolmaster lay in his house tossing on his bed in a fever.

"Follow me," said the eldest boy, "and do as I do."

He led them into the sick-room, and, going up to the master, said: "Good-morning, sir! You are looking quite yourself again."

"Am I?" said the schoolmaster. "I was feeling very ill."

"Oh no," said the boys. "You are nearly well again. You ought to get up and take a walk."

"Perhaps you are right," said the sick man. He got up, and in a few hours had quite recovered his health.



### WHAT THIS STORY TELLS US

**W**HAT do we mean by the spirit of a country? Does a country really have a spirit, and if so, what is it? This question is not so hard as it seems, for we do know that the people of a country differ very much in their ideas, and in the way they look upon the world. We say that the people of some countries are slow to change, dependable, and obey the laws; that the people of other nations are restless and unreliable. This story tries to tell how Canadians look upon their country, and the world, and what are the deepest feelings they have. We are told that the Canadians are proud of their own country, and yet are loyal to the British Empire; that they feel that their country is sure to become one of the most important parts of the world.

## THE SPIRIT OF CANADA

**W**HAT is the spirit of a country and where does it lie? At first this seems a puzzling question; but when we think about it a little we find that it can have only one answer: The spirit of a country is the spirit that animates the great mass of the people, and it has its home within their hearts.

You see, therefore, that each child of the nation is born to be a guardian of the spirit of the nation. To each one comes the responsibility of helping to give it strength to soar high in the heavens, with the strength and vision of an eagle, or of letting it creep along the ground, a broken moth, with feeble, fluttering wings.

Each person that we meet has one or more striking characteristics, which stand out as a sort of index of his spirit, and we say he is loyal, he is true, and honorable, or he is false, or dishonorable and cruel. Nations are made up of persons, and so they, too, have this index, and it is wise to take stock of our spirit, and hold fast to the good that is in us. As the boys and girls of to-day feel and think, so will the nation of to-morrow be.

Although Canada of to-day is a far different country from Canada of yesterday, to understand the spirit of Canada we must look back into the

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past. When we have done that we may look forward to the Canada of the future, which is destined to become a great and mighty nation.

For a century and a half, the history of Canada was one of conflict, and it was not until after the country came under the British flag that we find the beginning of constitutional government. This was given by the Quebec Act, which, although it did not provide for government by the people, was a constitution, under which the government had to work, and was in a measure a preparation for the responsible government which came later.

We must remember that at the time of the conquest of Canada, the French government was despotic, and the people were not accustomed to self-government and did not ask for it. It was otherwise with the English-speaking settlers in Ontario and the Maritime Provinces. They were of British blood, and had been fighting for liberty for many centuries.

Within twenty years after the conquest, the United States had fought the War of Independence, and had been declared independent. But, as we have read elsewhere, there were thousands of people who had not wished to revolt against Great Britain, and wished to keep their allegiance to

the flag under which they were born. Large numbers of these people were loyal to their principles and left the country to make new homes in other places. Many of them came to Ontario and New Brunswick, and the Eastern Provinces of Quebec. These pioneers, as we can imagine, were for the most part strong men and women, whose outstanding characteristic was their loyalty. They had a great influence on the future of the young nation, and loyalty is still one of the distinguishing marks of the Canadian spirit.

These men were not content with the government provided for them under the Quebec Act. They had a strong and determined love for liberty and freedom, and almost before they were settled in the country, they demanded the right to govern themselves. As early as 1784, New Brunswick received her first constitution, and four years later, a new constitution was given to Ontario and Quebec.

This was only the beginning of the struggle for complete self-government to which they were impelled by their love of liberty. It is true that some of the people were inclined to go more slowly than others. Some of the pioneer settlers were steeped in the shadowed memories of a past struggle for king, institutions and country. They were embittered against what seemed to them too democratic tendencies, and prejudiced against the radicals of England, who had assisted in ruining the royal cause in America, as well as against the French of Quebec, who had been so long the traditional enemies of England, and the sincere foes of British supremacy in North America.

It is difficult for the Canadian of to-day to comprehend the situation in those older days. Newspapers were so few as to be of little significance. Books were scarce, high-priced and of a character not intended to throw light upon existing problems. Towns were small and far apart, and the English settlers at first were scattered. Gradually, however, the population increased. Schools were founded, and the intellectual life of the provinces awoke. At first it showed itself chiefly in political activity.

The people of Lower Canada were still wrapped up in the traditions and surroundings of many years before. Under the British flag they were dreaming of

the ideals of Old France in the days of Louis XIV, and of New France in the time of Frontenac. When the parliamentary system of government came to them they accepted it as a part of the new situation, but soon learned to use it to defend their old institutions against change. In Upper Canada, the increasing population had different political ideas, and soon a struggle arose, between those who desired to hold on to what they looked upon as the settled order of things, and the more adventurous spirits who sought for greater progress and freer institutions.

From the struggles in both provinces came the Rebellion of 1837, and later the conflicts which ended in Confederation, in which the Maritime Provinces joined. British Columbia, which already had a constitution, soon became part of the Dominion, and, as the land was settled, the younger provinces came in. With Confederation came responsible government, the most democratic form of government there is, and to-day the rule of the people, by the people, and for the people, is recognized as the only possible form of government for Canada.

The political leaders have greatly changed in character as the country has slowly broadened from a colony into provinces, from provinces into the Dominion, and from the Dominion into a British nation. At first, the idea of Canada as a nation did not exist. For a time the English leaders strove to imitate English manners and customs, while the French continued to dream of the past. But as years advanced, a national feeling awoke. Quebec has lagged behind the other provinces, but in spite of what sometimes has seemed like backward steps on their part, there is an ever growing feeling that, whether French or English, all are Canadians. The people of Quebec see that their future is wrapped up in the future of the Dominion, and the majority realize that they as Canadians are interested in everything that promotes the interest of Canada.

Since Confederation, Canada has been practically independent, and can truly say, "Daughter am I in my mother's house; but mistress in my own." This does not mean that she has any desire to break away from the Motherland. On the contrary, the pride of Canadians in the British Empire has grown with the

passing years. Instead of putting on the cloak of Independence, Canada prefers to develop her resources and to work out her destiny within the empire of which she is a part. Suggestions of a break with the Motherland pass unnoticed, for the people have no interest in them. Nevertheless, though Canadians are proud of their place in the empire, proud of the work that the empire has done in the world, and of the stand that it has taken for justice and right, there is a strong national feeling in Canada. Canadians have a profound love for their native land, that is sometimes hidden, but is always there.

This feeling is closely interwoven with their love for, and pride in the empire of which the Dominion is a part. Like the people of all the sister Dominions, Canadians unite democratic institutions with a fervid love for, and loyalty to the British Crown; the knot, as it were, that ties the invisible cables that hold them together. They look upon the Motherland as grown children look upon the home of their childhood. It is the place where all have a common right to meet, where all are sure to find a welcome.

That this is no mere sentiment, but a deep, insistent feeling, has been proved on many a hard-fought battle-field. More than once Canadians have gone to the aid of the Motherland, unasked, that they might help her to uphold the standard of loyalty, right and justice. When the empire was hard pressed, Canada held back nothing. Her bravest sons went out to fight, her daughters stayed at home, not to weep, but to work, and she gave unstintingly of her resources to further the cause that she had at heart.

The continuance of these close ties is of great importance to the empire. Canada holds the bridge in territory, and power, and upon her continued loyalty depends the unity of the imperial system.

Canada lies in the great pathway of commerce; her transcontinental lines furnish the shortest routes around the world. Only a small, though increasing, part of the millions of acres of rich agricultural lands are under cultivation. Either wheat or traffic would make Canada a very prosperous nation. The inland water courses are being improved and this development will have a great influence upon transportation. Future generations may witness the unique

spectacle of vessels from Europe unloading from the elevators at Winnipeg or cruising for hundreds of miles up the Saskatchewan for cargoes of grain. This is an alluring prospect and the Canadian pluck and enterprise may bring. The waters of Canada, apart from the soil, are the greatest and most valuable undeveloped resource. More valuable than minerals, because, properly conserved, they will never be exhausted, but, on the contrary, they can be increased. Water power will be the most important factor in Canadian progress and industrial development. Canada possesses all the metals and minerals that mankind uses, but the wealth of her mines has scarcely been touched. Her fisheries, ranking with those of any other country, are yet in their infancy.

Her thousands of square miles of forests under proper care and management will ensure unlimited wealth for the future. All these conditions assure for Canada the foremost rank as a producer of raw materials and as a manufacturer of finished articles.

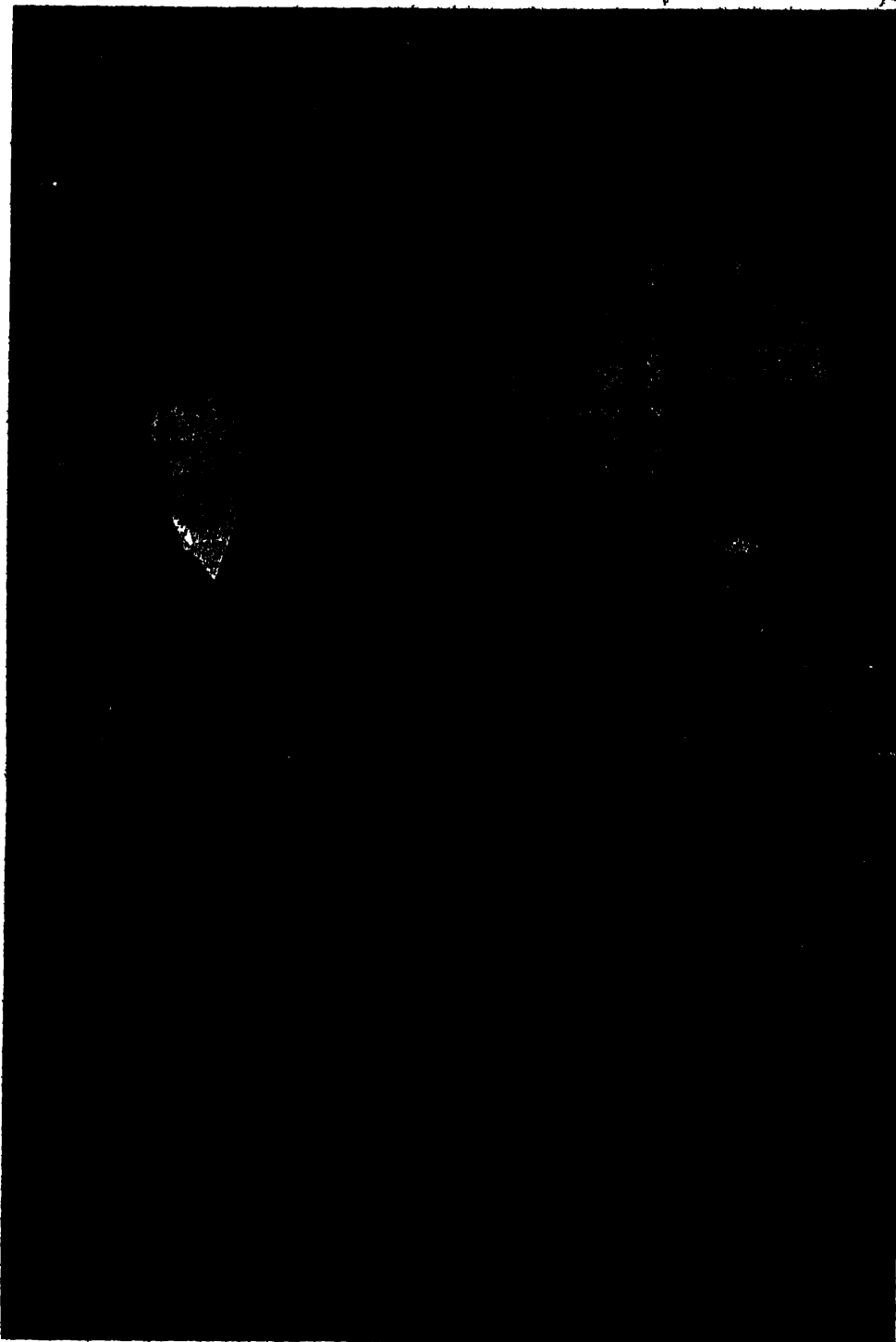
Canada has learned a valuable lesson from the great producing nations of the world. Everywhere else the policy of protection of natural resources was not developed until these resources had been largely exhausted.

In Canada the people have in time realized the importance of protection of the great natural wealth of the country, and much has been done by legislation to protect and help the development of the natural resources. The people know the importance of legislation dealing with the protection and the promotion of material wealth and the comparative unimportance of mere party conflicts.

The four hundred years of Canadian history which has gone into the making of the Dominion are of a nature to stamp its future with every fair prospect of success. The position of the country, the extent, the resources, the unity and the transportation facilities should make the wealth and the commerce of the future as certain as the aspirations of the people are strong.

While the people of Canada keep their loyalty, and hold fast their ideals of truth and justice, their faith in the Empire and the Dominion, and the unity without which no nation is strong, they need have no fear of the destiny of their country.

## A MODERN WIZARD



This picture of Thomas Alva Edison, in his vigorous old age, was taken in front of the first motor that he made when he was working out the system of electric lighting by incandescent lights, which have taken the place of arc lights. The little motor is carefully preserved in his power house, amid all the powerful machinery of which it was the forerunner. It is difficult to say which is the most important branch of electricity with which Mr. Edison has been connected. Photograph copyright, Brown Bros., New York

# THE BOOK OF MEN & WOMEN

## WHAT THIS STORY TELLS US

THIS is the story of a man who by hard work has gained a place in the admiration of his fellow countrymen which has been seldom surpassed. Few people are able to do such work as Thomas Alva Edison has done. We must remember, however, that if, at any time in his early life, he had been content with the work that he had done, he might have remained all his life a magazine vendor on a train, or a telegraph operator. If he had been content to stand still, not only his country and the world, but he himself, would have been the loser. He did not stand still, for he was discontented with himself, and so he is known the world over. It is probable that he would be well content to be known as a man who has always done his best, and, even though we cannot all make great inventions, that is a title that any one may deserve. We never know what we can do until we try, and so this story of a Modern Wizard who found out, by trying, what he could do, is of great interest and encouragement to us, though we may never accomplish the wonders he has achieved.

## A MODERN WIZARD

SUPPOSE you are a boy or girl living on a farm remote from a large town. Nevertheless you may sit on your veranda in the summer evening, reading THE BOOK OF KNOWLEDGE by electric light, while your mother sits gently swaying in her rocker, her needlework in her hands, listening to the voice of one of the great singers; your father sits, smoking, now and then standing up to change a record in the phonograph from which the sweet sounds come pouring out. Or perhaps it is a winter evening; then you may telephone to a party of young friends to come and dance to the music of a good orchestra, or, gathered round a cosy fire, you may listen to a recital by a great violinist, or if you have been reading in the Book of Men and Women of the music written by the great musicians, you may turn to your phonograph so that your ears may become familiar with the sweet and stirring songs, simple melodies, dances or great sonatas and symphonies that they have written. Or, perhaps, it is Friday evening. Home lessons are laid aside until Saturday; there is a "movie theatre" in the nearest village, or motion pictures are given in the school-house. Then for an hour or two you are taken to places of interest in our own country, or in places far distant;

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you laugh heartily over a comedy, or your hearts ache over some pathetic story. A great parade was held in one of the cities a week ago, and the men and women march down toward you on the picture screen; you see

the launching of a proud ship; the forging of a giant anchor; a carnival held in New Orleans, or in Rome, or perhaps a wedding procession in Bombay.

How all these things are done is told in other parts of the book. Here we are going to read something about the man to whom we owe it that our lives are so much richer than the lives of our grandfathers and grandmothers, or even our fathers and mothers when they were young.

Thomas Alva Edison worked out his inventions by known laws of science. This means that he studied these laws, so that he was able to apply them to make real the visions of his imagination. Yet he had few advantages and little help, and his story is one of those that inspire us to great effort to cultivate the talents that have been given to each one of us.

He was born in February, 1847, in the little village of Milan in Ohio. His parents were poor because his father did not keep to a settled occupation. He had the same kind of mind as his



wonder-working son; the kind of mind that is called versatile, that can easily turn from one thing to another. He had not learned, however, that it is necessary for a man with a versatile mind to learn to do one thing thoroughly before he turns to another, and so he was not successful.

Edison was a quiet, thoughtful little boy, but very inquisitive and always wanted to know how things were done. He was not very strong, however, and was not sent to school until he was quite a big child. When he did go, his teacher, who does not seem to have been very wise, thought him stupid because he asked so many questions. So his mother, who had herself been a teacher, took him away from school at the end of two months and taught him at home. With so kind and loving a teacher, he made rapid progress; and above all, he learned to think. His mother had some good books, which he learned to enjoy; and when he was ten years old, he read Gibbon's *Decline and Fall of the Roman Empire*; Hume's *History of England*, and began to study an encyclopedia. It was probably from the encyclopedia that he first learned to take an interest in chemistry.

By this time, his parents, who had moved with him to Port Huron, Michigan, were able to indulge him in his love for making experiments, so he bought some books, made a little laboratory in the cellar of his home, and there laid the foundation of his knowledge of chemistry.

When he was twelve years old, he decided to start out in life for himself and became a newsboy on the train which ran from Port Huron to Detroit. Such a newsboy had never been seen before. He was given a corner in the baggage car in which to keep his stocks of newspapers, magazines and candy. To this corner, he moved his little laboratory and library of chemical books, and when he was not engaged in his business, went on with his experiments. Still time hung heavy on his hands, and to fill it up, he bought a printing press and type and published on the train a weekly newspaper filled with local news, stories of things that happened on the railway and notes of the markets.

All went well for two or three years. But when he was in his sixteenth year, one day a phosphorus bottle was jarred off one of his shelves and broke on the floor. It set fire to the baggage car, and in his anger at the danger to his train, the

conductor not only put the boy off the train, but soundly boxed his ears. That was the most unfortunate part of the accident, for as a result of the boxing Edison gradually lost his hearing, and became almost totally deaf. His stock was lost, but an act of great bravery on his part brought to his aid a new resource, and opened up a new field for him to work in.

He was standing one day on the platform of the station at Clemons, in Michigan, watching a train come in, when he saw the station agent's little boy on the track right in front of the oncoming engine. Another moment and the child would have been crushed; but Edison sprang to the track, seized the little one in his arms, and rolled with him to one side, just in time to escape the wheels. To show his gratitude the baby's father offered to teach telegraphy to Edison. The offer was gratefully accepted, and now that his career as a train newsboy was closed he turned to his new accomplishment as a means of making a living.

He worked at telegraphy for some years, first in Port Huron, in Michigan, then at Stratford, in Canada, and a little later in the Western states, and finally in Boston, while at the same time he spent all his spare moments in the study of chemistry and electricity, and in experimenting on improved telegraph apparatus. It was during these years that he first turned his attention to duplex telegraphy, but through no fault of his own, he was unable to sell his invention, and the matter dropped for a time.

In 1860, when he was in his twenty-second year, he went to New York. He arrived penniless in the city; but he was a good telegraph operator, and was fearless of the future. And now a strange thing happened. He applied to the Gold and Stock Telegraph Company for work, and while he was waiting for a reply, part of the apparatus broke down. No one knew what was the matter, and everything was in confusion, until Edison said he could set the machine at work again. Permission was given him to try, and at the end of two hours, work in the office was going on as if nothing had happened. Edison was asked if he would accept a position at a salary of three hundred dollars a month, and needless to say, he accepted.

His new position gave him money and leisure for new inventions. In a little

over a year, he sold his telegraph inventions for a large sum of money. This enabled him once more to set up in business for himself. He built a factory in Newark, New Jersey, for the manufacture of telegraph apparatus, and since then his chief business has been that of making inventions.

The first great invention was the quadruplex system of telegraphy, about which you have read in the story of the telegraph. About the same time Edison made an improvement in the transmitter of the telephone which made it easier for the voice waves to travel, and improved the usefulness of the telephone very much.

It was just about the same time that he invented the phonograph. The idea of an instrument which would "write sound" and reproduce it, had been thought of before, by scientists, though it is doubtful if Edison knew of their efforts to make such an instrument. At any rate, he was the first to make an instrument which would work, and even he did not know that it would work until he heard it repeat the words that he had shouted into it. He says himself that when he put the reproducer in place and the instrument shouted back to him the words "Mary had a little lamb," he was never so taken aback in his life.

Edison patented his invention, which from the first excited the wonder of the world. Of course, like all first things, it was crude, and the sounds that it gave back were harsh. For the time he had to lay it aside, for other work pressed, but others took it up, and from his parent idea the gramophone, dictaphone and other instruments were invented. Later on, when he had more leisure, he commenced work on it again, and worked out a very perfect instrument which gives back every beautiful vibration from voice or instrument. The dictaphone, as you know, is a little instrument into which busy men and women dictate letters or documents or directions for work. Then the dictaphone operator causes the instrument to send the stored up sound waves into her ear, and from its dictation the letters or instructions can be written.

When electricity was first used for illumination, only large arc lights were used. The lamps sputtered and scattered sparks, and the light was so harsh that it could be used only for street lighting and large buildings such as factories, drill halls and

the like. Such a thing as incandescent lights, which make possible the use of softly shaded lamps or indirect lighting in our homes or the brilliant illumination of churches, concert halls and theatres, was not even thought of. This was the work for which Edison put aside the work on his phonograph. He believed that a number of lights could be supplied from one distributing wire, and he believed that the light could be improved so that its use would be a common thing, so he invented the incandescent lamp, and the system of circuit lighting of which you may read in the Story of American Inventors. He spent a couple of years over this work, and to perfect his system improved dynamo machines, and invented a whole scheme of distributing electricity so that it might be used for light, heat and power. The result is that you may sit on your veranda and read by a lamp lighted by electricity, the power for which has been generated perhaps at a waterfall miles away, and the same power sends electricity to work and light mills and factories, drive railway trains, and light the streets of villages and towns that would otherwise be dark.

Once his work on the incandescent lamp was on the way to success, Edison turned his attention to another great project, that of driving railway trains by electricity. He was not the first man in this field, but his work aroused interest in it, and his inventions are largely used.

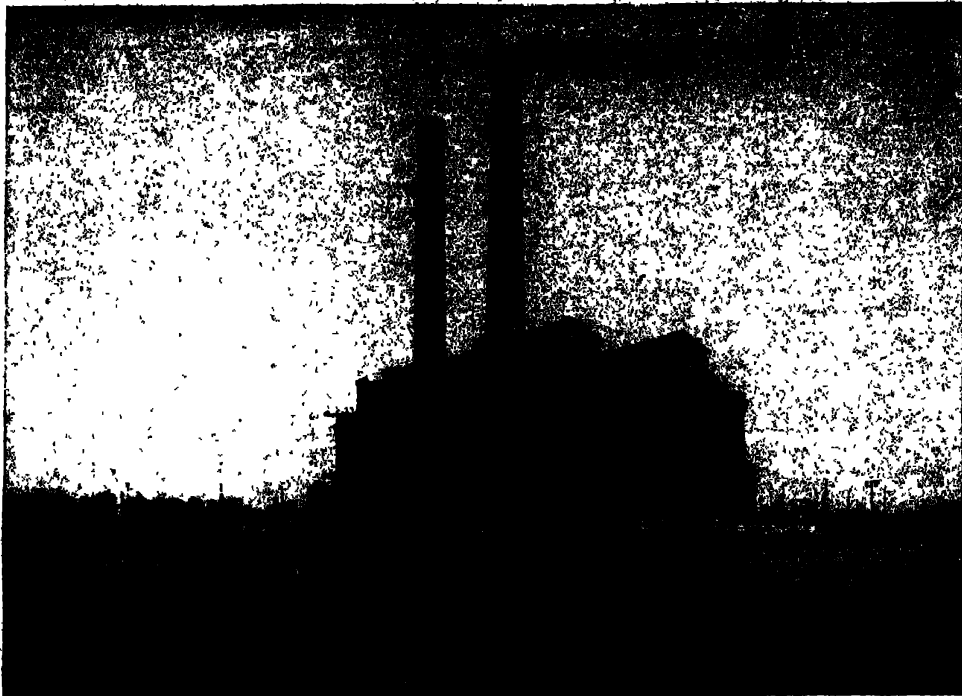
Now we come to the moving pictures, where again Edison took up an idea which others had had before him. From the story of the motion pictures, which is told on page 5135, you may see that while it cannot be said that he invented the moving pictures, the invention on which the moving pictures are based is his.

These inventions are only a small part of the work done by this wonderful man. He has invented a new storage battery, giant rolls to crush rocks, a kiln for use in making Portland cement, and numbers of other things which he needed to help him in the larger work in hand.

After the Great War commenced he found himself in danger of being cut off from his supply of carboric acid for his factories at St. Lawrence, New Jersey, so he devised a way of making it for himself, and also for making the benzol from which the carboric acid is produced.

THE NEXT STORY OF MEN AND WOMEN IS ON PAGE 6363.

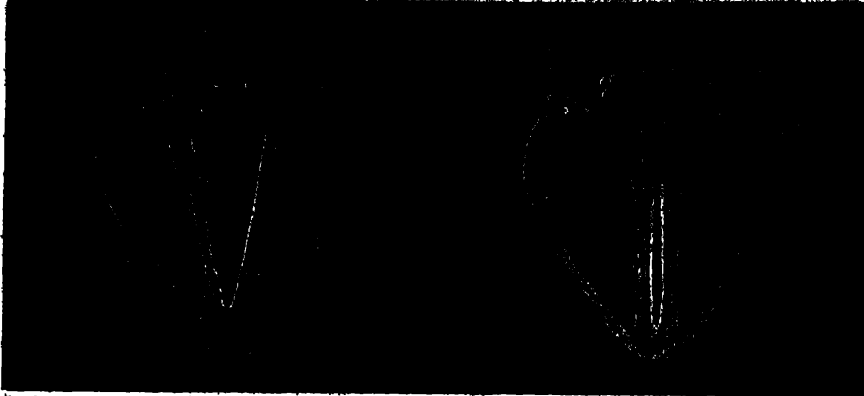
## WHERE ELECTRIC POWER IS GENERATED



Trains entering and leaving the Grand Central Terminal in New York are hauled by electric locomotives, which we show you in another place. The power is generated miles away in large power houses. This is the Port Morris station on Long Island Sound, so located because coal can be easily and cheaply brought to it, and there is also an abundant supply of water to condense the steam from the many great boilers.



Each of these large turbo-generators can develop about 7,000 horse power. The current is sent by cable to substations, which deliver it to the third rail, which you see beside the tracks. Mr. Edison did some important work on the use of electricity in transportation, but his attention was turned to other things. Pictures by courtesy of the New York Central Lines.



Jack's voice-box, with covering partly removed to show changing of position of vocal cords. First picture shows an opening for breathing, the second the cords forming chink for anging high note.

## JACK'S WIRELESS TELEPHONE

### THE BOX IN WHICH HE KEEPS HIS VOICE

WE remember that, as the air went down to ventilate Jack's house, it had to pass through a very narrow place, which was opened to let it go through. That opening has no use at all, so far as the ingoing air is concerned, though it is true that Jack can make noises, and even speak, by means of his ingoing air; but that is very tiring to Jack, and still more tiring to the people who have to listen to him. The real business of this narrow opening, and the voice-box that holds it, is with the air as it comes back from Jack's bellows. This air, we remember, is warmer, and much moister, than it was when it was taken into the lungs or bellows; it contains less oxygen, more carbon dioxide, and just the same quantity of nitrogen.

Other creatures can make more noise, some of them can make much and more alarming noise, some of them can make sweeter sounds and can keep up their voices for a longer time than Jack can, but no other creature has anything to approach the voice-box of Jack's house for the



beauty and the variety and the expressiveness and the usefulness of the sounds it can produce. Perhaps, however, if the truth were told, the credit of this goes less to Jack's voice-box than to the wonderful group of head-servants who live in the upper part of his brain.

Now, before we describe this voice-box or larynx, we must understand what it really is, and what it enables Jack to do. We know already that his house, like some great office or hospital, has a magnificent telephone system of its own, by which all its parts can communicate with one another. We already know very well that this wonderful telephone system has millions of little batteries called nerve-cells, and that these nerve-cells communicate with each other, and with every part of Jack's house, by means of a wonderful kind of living wires which are called nerves. These nerves do undoubtedly play exactly the part of wires: messages run through them; they direct the course of the messages and keep the different kinds of messages to them-

selves. The nerves are definitely of two kinds—one carrying messages from Jack's brain only *outwards*, and one carrying messages only *inwards* to the brain. If these nerves are cut, the messages cannot travel.

But an office or a hospital not only needs its own private telephone system, but also requires some arrangement to enable it to communicate with the outside world. It requires a machine for sending messages, and it requires also another kind of machine, called a receiver, for taking in messages. Now, if an office or a hospital requires such arrangements, much more does Jack's house. Any other kind of house may get along by itself, but Jack's house cannot. It was made and meant to be one of many, all living together, and helping one another, and communicating with, and serving one another.

#### THE TELEPHONE THAT IS ALWAYS MOVING

It follows that the arrangements for sending and receiving messages are of the first importance in Jack's house; and here a difficulty at once arises. Ordinary houses are built to stand still where they are placed, and there is no particular difficulty in setting up machines in them with wires through which the occupants of the houses can speak to each other and be spoken to. But we could hardly have a telephone put into our house if it were constantly walking and running about, and might any day set out without warning to make a journey of a hundred or a thousand miles.

There are, of course, such things as wireless telephones, and people can talk to each other by means of telephones at great distances without wires, just as they can telegraph to each other. What happens is simply that the electric waves, which, in other cases, run along wires, in this case run through the air in an invisible kind of something we call the ether. This we consider exceedingly wonderful, but it is really one of the oldest things, and we all do it every day, although instruments for wireless telephony were invented only a very short while ago.

#### WHAT JACK'S VOICE-BOX REALLY DOES

Jack has in his throat a marvelous machine for making waves, which need

and have no wire, and with this machine he daily telephones—which means "sound afar" or "speak from a distance"—to the people around him, everyone of whom has the same kind of instrument; and he also possesses a much more wonderful receiver, called the ear, which catches these waves, and then sends an account of them to the brain by means of certain of the wires that go to make up the *inside* telephone system of Jack's house. Now we have some idea of what Jack's voice-box really does, and we can proceed to examine it and see how it does it.

Of course, it is not always in action—if Jack has any sense. Yet when it is not in action it must always be on its good behavior, for as long as Jack lives air must pass through it, whether or not it chooses to make use of the air on its own account.

This wonderful voice-box, or larynx, the message-sender of Jack's wireless telephone, is made up of a number of separate pieces of cartilage, or gristle, a firm, fairly stiff substance which is not bone, and yet is something like it. When Jack's house grows very old, these pieces of gristle are likely to get too much lime in them, and become more like bone than they should; and this is probably the chief reason why the voices of old people change, and become weak and shaky.

#### WHEN JACK'S BOX GROWS MUCH BIGGER

When these pieces of cartilage are put together they make a kind of box, which we can readily see and feel in the throat, and which is sometimes called Adam's apple, because of the stupid idea that it is the apple that Adam swallowed, which stuck in his throat. It is true, however, that this "apple" is much bigger and more noticeable in men than in women, and that is why men have stronger and deeper voices than women.

When Jack and Jill are children their voice-boxes are very small, but at some time in their teens their voice-boxes, especially Jack's, grow much bigger. This happens so quickly in Jack's case that, for a time, he loses control of his voice-box, and his voice is likely to break, and sound sometimes high and sometimes low without his meaning to make the difference. Also, if he has been a singer, his pure child-like high notes

begin to go, and gradually he gets deeper notes which he never had before.

When the voice-box has grown up, so to say, we can readily feel in our throats the largest of the cartilages, which projects forwards, and beneath it we can feel a regular, strong ring, which is the lowest of the cartilages, and supports the others.

But we can really learn nothing about this voice-box until we look inside it. In the middle of last century an inventive Spaniard, a great teacher of singing, called Manuel Garcia—who lived to be more than a hundred years old—thought he would like to be able to see the inside of his own voice-box, and he actually invented a little mirror which can be passed into the back of Jack's throat, and with which can be seen reflected the inside of the voice-box. Garcia invented this laryngoscope, or larynx-seer, because he wanted to learn about singing; but, somewhat improved, it has become a valuable invention for doctors, enabling them to save many lives and voices and relieve a very large amount of pain.

#### THE CORDS THAT HELP JACK AND JILL TO SPEAK

What we see with the aid of the laryngoscope is a pair of vocal cords. When these are quite well they are pale white to look at, and they move together, towards or away from each other, quickly and easily and equally; so that the space between them is always exactly in the middle of the larynx, and that means also exactly in the middle of Jack's house. If one cord were moving badly, the other would come across to try to meet it. Also, if Jack has been talking too much, or has been smoking too much—a very common reason—and also in people who drink too much, the cords are not pale white, but slightly reddish, and then the voice is husky, and soon grows tired.

The cords are made of pure elastic fibres, covered by a layer of smooth, flat cells. In front, as the picture shows, they are attached close together behind the front part of the big cartilage which we can see and feel so easily.

But each of the cords is attached behind to a corner of a little separate piece of cartilage, and each of these pieces of cartilage is so posed that it can rotate and twist upon itself. When it

twists in one direction, it carries the end of that vocal cord towards the middle of Jack's throat, to meet the other cord. In health, both cords always move at the same time, and so in this case the cords will almost meet—not quite, but very nearly. Every time Jack speaks or sings, this is the first thing he does; and if he cannot bring his cords close together like this he has lost his voice, and can only whisper.

#### WHEN JACK SHOUTS AT THE TOP OF HIS VOICE

But when the piece of cartilage that carries the back end of its vocal cord twists on itself in the other direction, it carries the cord away from the middle, and away from its fellow. Both little cartilages do this at the same time, and now what was before a narrow chink becomes a triangular opening that readily lets air through in either direction, without producing any sound.

Our business now is with what happens when Jack puts his vocal cords together as the air is coming out of his chest. In the first place, he does not content himself with letting the air come out by the elastic recoil of his stretched lungs and ribs and muscles, as he usually does. That would not give him enough force for his purpose. On these occasions he makes a "forced expiration." By contracting the muscles of the ribs and calling on the great muscle named the diaphragm for assistance he expels the air with great force through the narrow passage in the voice box. To get enough outgoing breath to do this, Jack and Jill must learn to fill the lower part of their lungs very full of air.

#### THE WAVES THAT SPREAD IN ALL DIRECTIONS

But to be able to make a loud sound, Jack must do even more than all this. Not only does he bring his vocal cords together, but he also deliberately makes them tight. The cartilages to which their back ends are fixed sit on the top of the ring cartilage, which is shaped at the back exactly like a signet ring, and has a wide space for them to rest on. Now, when Jack thinks fit, he can tilt these little cartilages backwards so as to make his vocal cords tight; and then, if a current of air is pressed hard and suddenly against them, they have no choice but to vibrate, or tremble, like

any tight string you might pluck with your finger.

Thus Jack's wireless telephone produces air-waves — commonly called sound—which leave his house, and may be picked up by any receiver, such as the ear of a man or an animal, or the receiver of a phonograph. These waves, like the waves of other wireless telephony or telegraphy, spread in all directions, and cannot be directed beyond a slight degree, because there is no wire to confine them.

#### THE TINY THINGS ON WHICH THE BEAUTY OF SPEAKING DEPENDS

The pitch of the sound depends on the number of waves produced in a second, and that depends entirely on the tightness of Jack's cords. It differs in different people, because some have heavier and longer cords, and these will always vibrate more slowly, and make lower-pitched sounds, however tight they may be pulled. But, in any particular case, the higher notes will be produced when Jack tightens his cords, and the lower notes when he relaxes them. He does so all the time, when he is speaking or singing. Listen to anyone speaking, and you will hear how the pitch of his voice rises and falls, differently at different times; so that, for instance, you could tell by the change in pitch that he was asking a question even if he were using a language that you did not understand. Half the beauty and interest and expressiveness of speaking and reading aloud depends on these changes of pitch—which depend on the use of a tiny pair of muscles, and a special pair of nerves. Men who speak in public ought to pay as much attention to the way they use their voices as singers and actors do.

#### HOW EVERY PART OF THE HOUSE HELPS JACK TO SING

In great singers this power is marvelous. They can control the pitch of the voice within wide limits, at their will. They can maintain the clearness and beauty of the tone equally when they are singing so softly that the note sung is like a far-off whisper of fairy sweetness, and when they are producing a great outburst of sound; and they can alter, also, the quality of the tone in order to express different kinds of feeling.

But 't is not to be supposed that the

voice-box itself, without any help, is equal to all this, much less to producing words. On the contrary, every neighboring part of Jack's house is called on for aid. When he speaks or sings deep and loud, he can feel his whole chest vibrating and helping to make the sound what it is. His whole throat is at work, too. Indeed, unless he has been properly taught to sing, he is in danger of using his throat too much, or using it in the wrong way, and in that case he may produce sounds that make us say that he sings "out of tune." His tongue is always at work, either lying low and smooth in the floor of his mouth, or moving about to make the vowels or consonants. His lips are at it, too, as deaf people know, when they learn to read the lips because they cannot hear. His soft palate, at the back of the roof of his mouth, rises and closes the back of his nose, so that he does not produce a nasal tone; and in good singers, when they sing high and loud, if we put our fingers on their nose or cheek-bones, we can feel them all vibrating and helping the sound, just as the chest does with the lower notes.

#### THE MACHINERY THAT WORKS TO PRODUCE LANGUAGE AND MUSIC

All this complicated machinery works with exquisite ease and skill and harmony whenever we speak or sing properly, and it produces either the universal language called music, which can express things, like joy or sorrow, that all can understand; or else it produces a special set of waves—and interruptions to the waves, which are called consonants, like p and m and t—which form a code or set of signals, called a language, just like the code used in ordinary telegraphy. Our native language seems "natural" to us, because we grew up with it; but really it is a quite artificial code, and we show this when we criticize any code we don't understand—though it is probably just as good as ours—and call it "gibberish." The only exception to this is that a few words in all codes are not really artificial, but are more or less imitations of the natural sounds—such words as whisper, and buzz, and tinkle, and coo, and so on. And we now have some idea of Jack's wireless telephone, its exceedingly great wonder, and the beauty of the way in which it works, although only a very small part of it has been described.

# The Book of FAMILIAR THINGS

## WHAT THIS STORY TELLS US

THE complicated lock of the present day is very different from the simple lock of a thousand years ago. The locksmith was an important man in the Middle Ages and made some wonderful locks, though they cannot compare with the locks of the present day. In our times the burglar and the locksmith are waging constant war, and the locksmith is making better and better locks, because the burglars have grown more and more skilful. The best locks of the present day afford almost perfect security, but some intelligent burglar may discover some method of opening them. We show you in the pictures some of the simplest forms of locks and also some of the more complicated. The best lock of these days is an interesting bit of mechanism, and the great vaults look as if they were too strong for any thief.

## HOW A LOCK IS MADE

THE lock was probably the first invention of man when he had become sufficiently civilized to desire to keep things. Before that, a hollow tree, a cave, a hut of branches were his dwelling, the skin of an animal protected him when cold; his food supply was drawn from the wild animals and fish in the woods and streams. When supplies ran short he could easily move, for there was nothing to move but his own body. There was nothing worth stealing and so there was no idea of property rights.

But he moved a step upward—he became a herdsman, a shepherd, a farmer, a mechanic in a rude way. He acquired pots, pans, kettles, weapons, tools, and all of them took so long to make that he valued them, and then there came to him the idea that he must invent a way to keep secure these things when he had to be away from his dwelling place, or was asleep at night. *The lock* was the result of his idea.

This was probably not more than 5,000 years ago, for the oldest traces that we have of locks are among the early Egyptians, and the next in order are of Chinese origin. There has been a great improvement in locks during the past hundred years, and to-day, in our country, the catalogues show more

CONTINUED FROM 6317

than sixty-five different kinds, each of these being for a special purpose. Thus we have airlocks, automobile locks, barn door locks, keyless locks, padlocks, car and switch locks, safe deposit locks, combination safe locks and many others.

At first the Romans and Greeks had very simple safeguards. A leather thong tied in curious knots around the handle of the door was the only lock, the knack of unloosing it the sole key. Then bars or bolts were used, and we can find in old writings how the ancients invented devices for controlling them. A leather thong with a loop or a hook on the end was inserted through a hole in the door, and this would move the bolt in the manner required. So the bolt was a rude lock in the same degree that the thong was a rude key. Later in their history they had real locks and keys, for keys and traces of locks have been found in the ruins of their camps and cities.

Some of the locksmiths of the middle ages did very beautiful work and made ingenious structures which, however, could not resist master keys, picks or shelter keys in the hands of skilful workmen. Some of these Middle Ages locks for great buildings are monsters in size, with keys two or three feet



long. Some, made with crude hand-made tools, are beautiful miniature locks with keys no more than one-half inch in length.

#### THE LOCKSMITH AN IMPORTANT FIGURE IN THE MIDDLE AGES

In the sixteenth century, in Germany, Italy, France and England, the locksmith was a very important figure. He was an artist in bronze, iron and copper, his secrets were carefully guarded, his apprentices numerous, and distinguished by a special dress. Only a few of his locks have been preserved to us, but there are fine collections of keys in the museums of Europe, and from these we can grasp the nature of the lock and the beauty of its design. Little figures, escutcheons and armorial bearings, ornaments and piercings transform our little insignificant "opener" into an object of art. The day of factories had, not dawned, and every lock and key was hand-made, and called for the devoted skill and patience of the master-locksmith or clever apprentice. Gone were the large sickle-shaped keys of antiquity, born on the shoulder of warden or slave. The lady of the house wore the keys of still-room, linen-chest, and plate closet, suspended from her girdle as an ornament, as well as an essential part of her dress.

Ornamental locks and keys are sometimes used to-day, but they are generally copies of those made in the sixteenth century, and, except for their mechanical difficulty, not superior in any way to these. The medieval locksmith devoted his skill to the ornamenting and elaborating of his locks; he did not make them secure against robbers. With the growth of banks, the increased use of money, the greater accumulation of wealth, due to the invention of machinery, strong need arose for greater means of security.

#### THE GREATEST OF THE MODERN LOCKSMITHS

In the first half of the nineteenth century was laid the foundations for the wonderful development of the lock-making industry which has taken place in the last fifty years. Perhaps the most widely known name in this trade is Yale. Linus Yale, Sr., started as a lockmaker about 1840. He made a brilliant record as a maker of bank locks, and died in 1857, after making his mark upon the trade. Then came Linus Yale, Jr., who invented the famous pin-tumbler locks,

which are known all over the world. In this lock Yale went back to the ancient Egyptian lock for his principle, and made a small flat key instead of the cumbersome keys previously used. Many other improvements were made by Mr. Yale, who may be called the greatest of modern locksmiths.

No matter how difficult a lock may be, there is always a point of danger in the keyhole. Many devices to hide the keyhole, and even to take the place of a lock proper, have been tried, but the only one in general use is the combination lock. This is a lock in which the arranging of the internal parts in their proper positions is done from the outside by merely using numbers or letters in their right order. These numbers show on a disk which is usually marked up to 100. In this case the only key is a secret, which is to use the right figures in correct order.

These improvements made the combination lock almost unpickable. But still there was a secret, which, if known, would open the lock, and burglars used to force by torture the possessor of this secret to give it up. This was the origin of the famous masked burglars, which resulted in robberies amounting to millions.

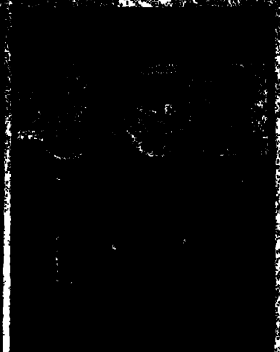
#### THE TIME LOCK WHICH GUARDS THE VAULTS

Then the inventors took another step and produced the time lock, which can only be opened at certain hours. Still the burglar found a way of introducing liquid explosives into the space surrounding the lock spindles. Many burglaries were committed in this manner.

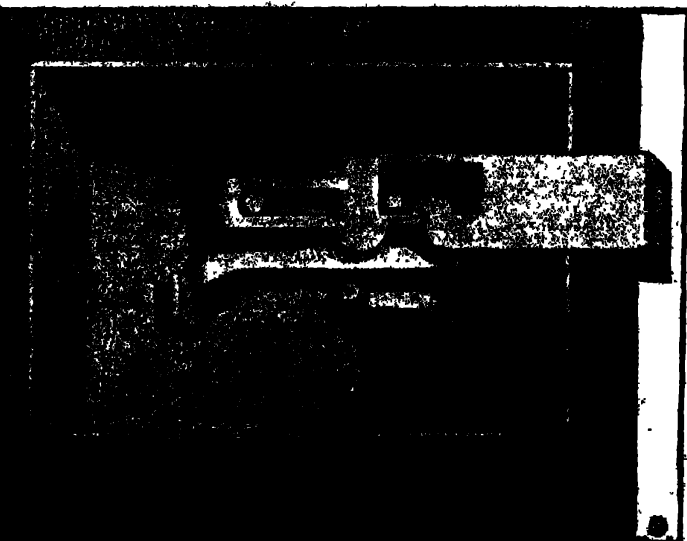
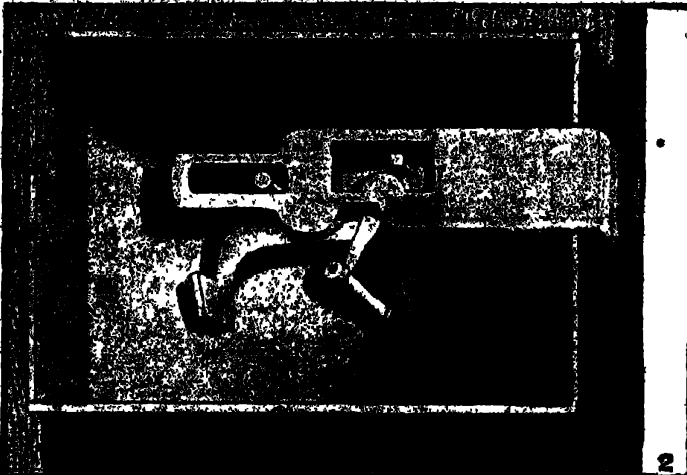
The problem was to make the introduction of these explosives impossible, and to do this the spindle-holes had to be done away with. This is done by a motor device working with a time lock. The motor throws the bolts and draws them back according to the setting of the time lock. And the door of the safe is as secure as any other part of it. The only way to overcome it is by such force as will destroy the whole structure.

We have to-day locks of many kinds, and it seems that the manufacturers have made our treasures secure. It has come to be a contest between the burglar and the locksmith, each trying to overcome the other. The locksmith seems to be gaining, for his locks are much more difficult to pick than those of former times.

THE NEXT STORY OF FAMILIAR THINGS IS ON PAGE 6377.

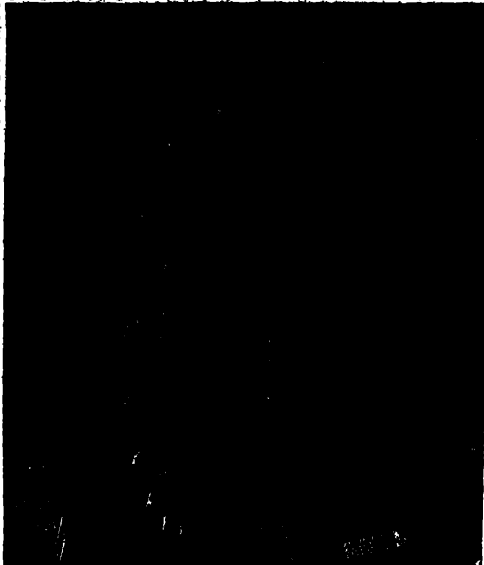


Locks are as old as civilization and were first made of wood. It was in the reign of Alfred the Great that locks were first manufactured in England, but there was little improvement in their construction until the end of the eighteenth century. Since that time there have been marvelous developments, until we have the elaborate and costly locks shown on other pages. Here we see how the common tumbler lock works. This is the ordinary cheap lock found on cupboards and drawers. As shown in this picture, a metal "tumbler" works on a pivot, A. A stud, B, projects from the tumbler and fits into a notch in the bolt, preventing the bolt from moving either way. But when the key is turned, as seen in picture 2, the "bit," or flat part of the key, lifts the tumbler and enables the bolt to be pushed along as seen in picture 3. As soon as the key is turned right round the tumbler falls, its stud fitting into a second notch in the bolt and holding it firm. Picture 4 shows the wards, or projections, which prevent any key but one specially cut to fit the lock from turning round, and in picture 5 we see how the right key can be turned over the wards.



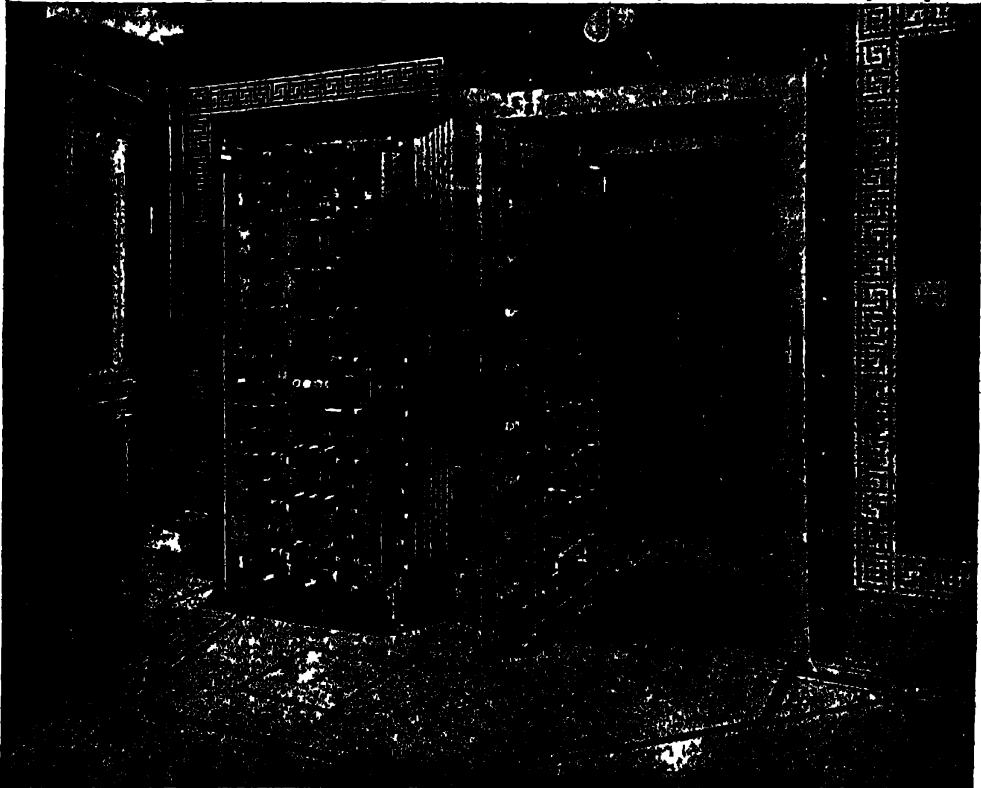
THESE PICTURES SHOW THE INSIDE OF THE LOCK OF AN ORDINARY DOOR

## DOORS THAT COST THOUSANDS OF DOLLARS



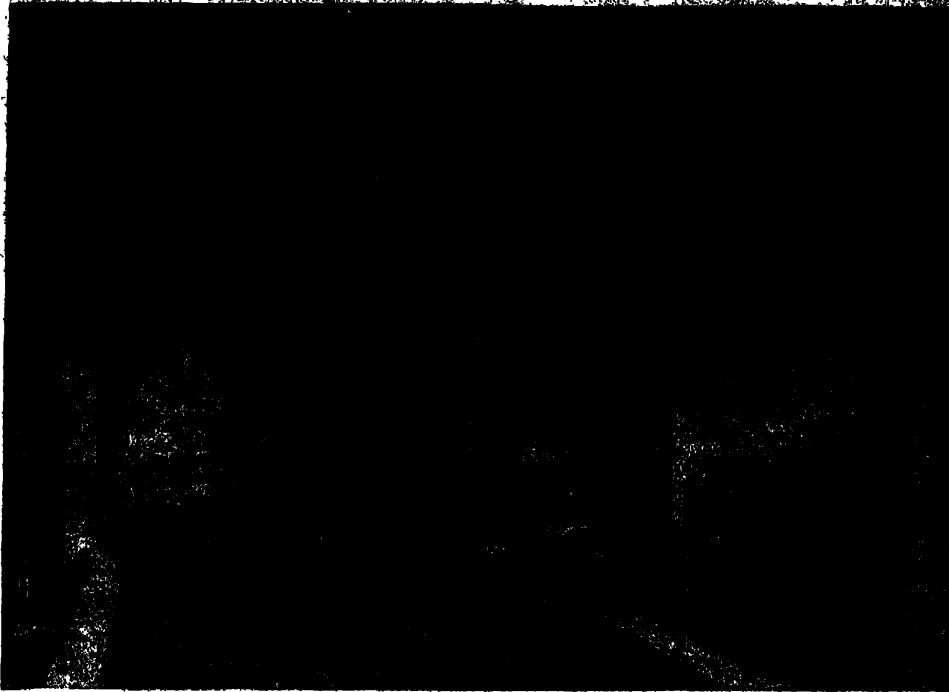
Our great-grandfathers kept their treasures in a strong box made of wood bound round with iron. To-day a skilled burglar would laugh at such a treasure-store, and we build wonderful burglar-proof and fire-proof steel vaults, with doors like that shown in this picture, that often weigh more than twenty tons each.

Sometimes the doors are round in shape. They have a marvelous system of bolts and fastenings, and the lock can be set to open at a certain time in the future. If once the door is locked, no human power can unlock it till the fixed time arrives. At the exact hour certain levers fall, and then the door may be opened.

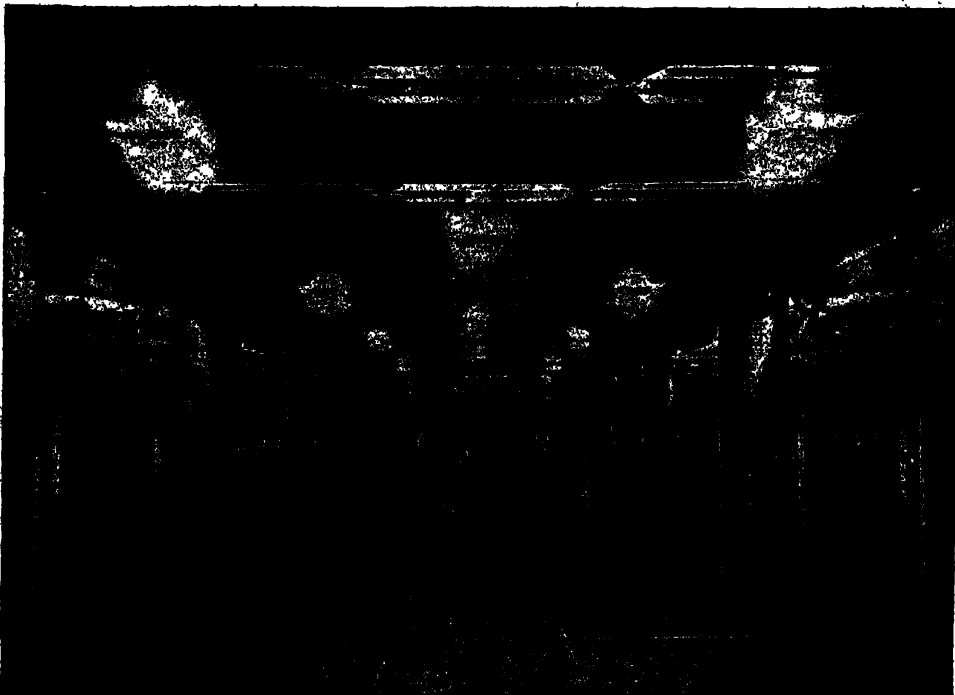


Here is one of the strongest doors ever built. It is a double door—that is, the door seen on the right closes and then the one on the left is shut over it. This door cost more than five thousand dollars. The key has a dial upon it with a number of letters that can be arranged in thousands of ways. Once the door is locked, it cannot be unlocked unless the letters on the key are arranged exactly the same as they were when the door was locked.

## WHERE MILLIONS ARE SAFELY KEPT

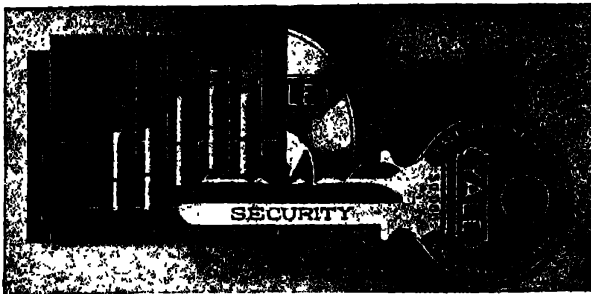


This is the outer door of one of the largest and safest vaults in the world. The great door weighs forty tons, yet swings easily upon ball bearings. Notice the great bolts around the rim which shoot past the rim. The tube to the right is a telescope through which only the person working the combination can see the dial, which is well-protected. The combination is worked by means of the wheel beside the dial.



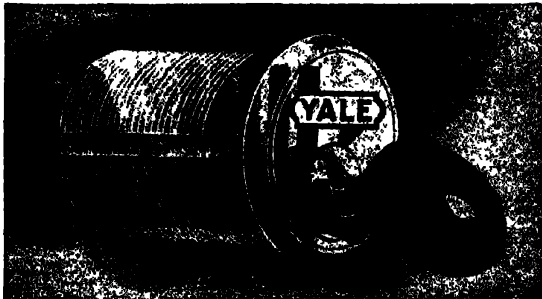
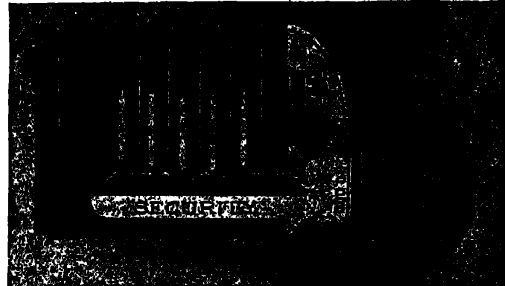
Here is the inside of the underground vault, the door of which we saw above. To the right and left are hundreds of boxes which are rented to those who wish a place in which to keep their papers, jewels and other valuables. Some boxes are opened by combinations and some by keys, as shown on other pages. Pictures by courtesy of the Guaranty Trust Company.

## HOW LOCKS WORK IN HOUSE AND BANK

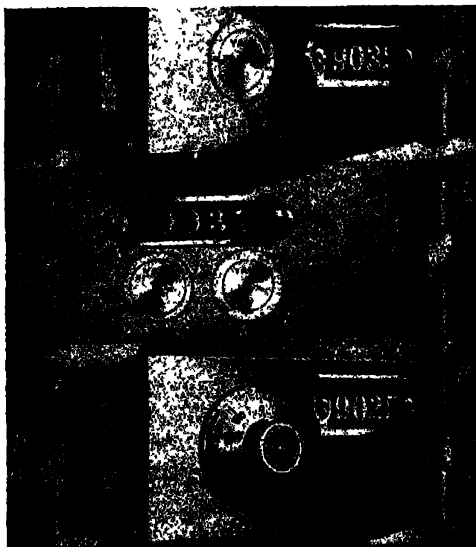


This picture shows a lock cut through the middle. Inside the lock are several little steel pegs of different lengths, called pin-tumblers, made in two or more parts. When the key is put they are pushed toward the bottom by the springs, and as part of each is in the outer cylinder and part in the inner, they will not allow the inner cylinder to turn around. The bolt is attached to the inner cylinder and moves with it. Let us push in a key and see what will happen then. It is easy to find a key which will slide into the key slot even though it was not made for that particular lock. The keys look much alike.

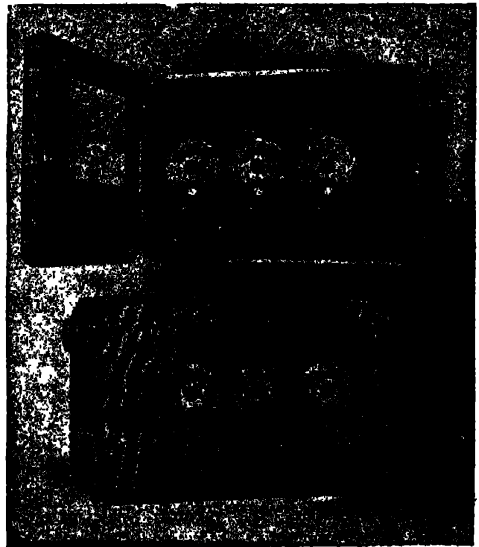
Here we see the proper key pushed all the way in. Notice each one of the little pins has been pushed up toward the top of the lock. Notice, too, that the division in each little pin comes exactly at the line between the inner and outer cylinders of the lock. You can see that a twist of the key would turn the inner cylinder inside of the larger one. The end of the cylinder away from the key is connected with the bolt and turns it. But if one of the notches in the key were a little deeper or a little shallower, one piece of the pin would be partly in one cylinder and partly in another and would not allow the inner cylinder to turn. A difference of one-fiftieth of an inch in the position of one pin will prevent the cylinder from turning.



This is how the lock would look if it were made of glass. You can see the inner cylinder turning, and can see the ends of the pin-tumblers as they are being turned inside the outer cylinder. The bolt is moved by the projection at the rear, which you see turning. It is very easy for the manufacturers to make the length of the tumblers or the depth of the notches just a little different. They say that 27,000 locks are made so that no key will unlock more than one. In the next 27,000 locks there is also one which your key will open, and so on. If you were to try every lock you saw you might find one your key would unlock, but it would take a very long time, and you might never find the duplicate.

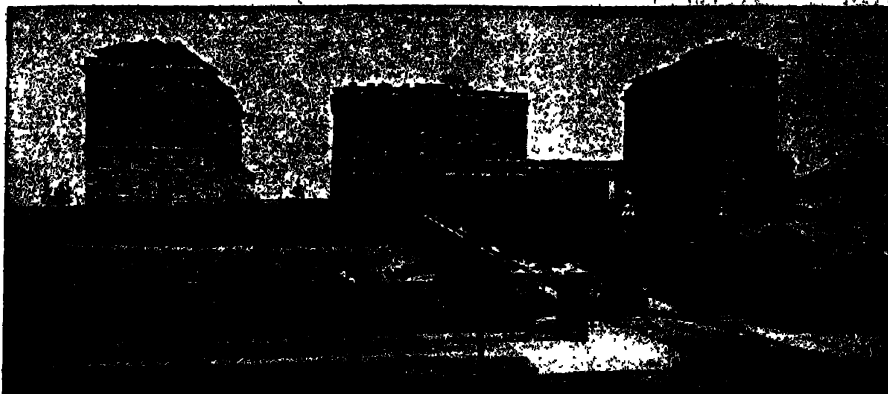


Many people have a box in a safe deposit vault, such as we saw on another page, in which they keep valuable papers or jewels. The boxes are made of steel, and are easily drawn out when the doors are opened. Some of the doors require two keys, and some have combination locks.



A time lock is placed in the inside of a safe door. It can be set to open any number of hours after, and until that time has come, no one, even if he knows the combination, can open the door. Each of these dials can open the door. There are three for safety, as one might possibly get out of order.

# The Book of MEN & WOMEN



Rockefeller Institute, A Home of Scientists.

## SCIENTISTS WHO HAVE SAVED LIVES

IN the olden days students of medicine studied with practising physicians. Often these students were college graduates, but often they were not, and when laws were made declaring that all students of medicine should attend a medical college, too often the teaching in these medical colleges was very narrow. The fact of the matter was that all it was thought necessary that a student of medicine should study was anatomy, the symptoms of diseases, and the medicines needed to overcome the ravages of illness. Most of them, of course, were what we call cultivated men. Many of them were learned in subjects which did not seem to have much reference to the science of medicine; but this was not thought necessary to their usefulness in their profession.

A change from this way of thinking came in the nineteenth century. In our day a student of medicine knows that he must study the laws of every science that has to do with life in any form, no matter how lowly. Moreover, the best doctors have learned to believe that the chief use of medical science is to teach people how to obey the laws of health so that they may keep well. In other words, they believe that it is easier to prevent illness

than to repair the hurts that it has caused. Before they came to this point, doctors had to learn the cause of illness. The men of whom we have told you in the Story of Great Doctors, learned a great deal about the anatomy of the human frame, but they did not know much about the causes of illness, and the story of those who learned how to gain this knowledge is the story that we shall tell you here.

### LOUIS PASTEUR, WHO LEARNED IMPORTANCE OF MICROBES

Strangely enough, Louis Pasteur, the man who first found the pathway to this new knowledge, was not a doctor of medicine, but a chemist. He was born in a little French town called Dôle, in the valley of the Saône, where his father, who had been a soldier in Napoleon's army, had settled down to his work as a tanner. While Louis was still very young, his father and mother moved to Arbois, where there was a good school, which he attended. Afterward he went to the college of Arbois, where the director advised him to prepare for the great École Normale, or normal school, at Paris, so that he might become a professor in one of the great colleges in France. His father and mother were determined to give him all the advantages they could, and when he was

sixteen, Louis was sent to Paris to prepare for the École Normale, but he was so homesick that he fell ill, and had to go home again. Then he went to the Royal College at Besançon, where he took his bachelor's degree in literature. After he took his degree he was made an assistant teacher in mathematics, and while he taught, he prepared for the examination necessary to admit him to the École Normale. The professor in chemistry at Besançon, who was an enthusiast in his science, roused Pasteur's interest in it. However, when he went up for his examination at the École Normale, he only got a pass on his chemistry examination, and was so little satisfied with this that he refused to accept it. He went to Paris for a year's study, entered for the examination again the next year, and this time his name appeared fourth on the list. During this year of study, the influence of J. B. A. Dumas, whose lectures he attended at the Sorbonne, induced him to devote himself to chemistry. He entered the École Normale in 1844 and three years later took his degree in physical science.

In Paris, where he was appointed assistant in the laboratory at the Sorbonne, he made his first great discovery. A chemist, named J. B. Biot, had made experiments which led to discovery about the effect of light on the crystals of tartaric acid, and Pasteur, in his study of the crystals completed the discovery and finished the work that Biot had begun. The discovery was very important, and when the experiment was carried out in his presence, Biot cried out, "My dear child, I have loved science so well throughout my life that this makes my heart beat fast."

As a result of this discovery of what he called left-handed tartrates, Pasteur was made professor of chemistry at Strassburg, and soon afterward he married Mademoiselle Laurent, who made him very happy in the life that they spent together. It was a very busy life, for the young professor constantly lived up to his motto, "Travailler, travailler, toujours"—"Work, always work." A few years after his marriage he was made dean and professor of science at the University of Lille, and though he had much teaching to do, he still went on with his search after the true answers to puzzling questions. One day he paid a

visit to a brewery at Lille, and while he was there he became interested in the question, "Why does beer turn sour?" It was a question which had puzzled many wise men for centuries, but Pasteur answered it. We cannot possibly follow him through all the steps that he took, and the long hours that he spent in his laboratory before he found the answer. It is enough to say that, helped by the experiments he had already made with tartaric acid and fermentation, he found that beer and wine and milk are turned sour by the action of living organisms called microbes, and that these microbes swarm in the air around us. "Keep your air free from microbes or keep the microbes from your vats," he said, "and your milk and wine and beer will not turn sour."

He was now recognized as one of the greatest chemists of his time. He was appointed to an important post in the École Normale, and later on he was made professor of chemistry at the Sorbonne. Meantime he found out the nature of the disease among silkworms that had almost destroyed the silk industry in France; and he discovered the microbes which cause cholera, which was exterminating French poultry, and the disease called anthrax, which is fatal to sheep and cattle. Up to this time the disease called rabies in dogs was a cause of terror, for the bite of a dog that is ill with rabies is certain to produce hydrophobia in man. Pasteur became certain that this illness, too, was caused by a microbe, and did not rest until he found the microbe and discovered a way to make a person who had been bitten, proof against the ravages of this deadly little form of life. A campaign against rabies was immediately begun, and the disease has been almost wholly stamped out in some countries.

Pasteur lived to the age of seventy-three, and when he died in 1895 he was buried in the grounds of the Pasteur Institute, which had been founded for the treatment of hydrophobia. There is also a Pasteur Institute in New York, but happily there are now few cases of this dreaded disease for treatment in the United States.

Up to the time that Pasteur discovered the part played by microbes in the fermentation of beer, many had believed that it might have been caused by spontaneous generation, which meant that

life could come suddenly into being without cause. Pasteur's discovery quite upset this theory and set the whole scientific world talking, but only one man, Joseph Lister, saw what it meant to human life.

#### JOSEPH LISTER, WHO FOUNDED MODERN HOSPITAL TREATMENT

Joseph Lister, whose father improved the microscope, was born in Upton, near London, in 1827, and was five years younger than Pasteur. His family belonged to the Society of Friends, and the

this suffering, but except in maintaining greater cleanliness, he had made little progress, when he heard of Pasteur's discovery of the microbes that cause fermentation. That gave him the clue that he wanted. He had already come to the conclusion that hospital gangrene was caused by microbes, and study with his microscope showed him that this was the case. When he went to Glasgow, "hospital gangrene" was raging, and he set himself to stamp it out. Pasteur's discovery taught him that the microbes



Louis Pasteur in his Laboratory.

youth was educated at their schools and at University College, London. He took his degree of B.A. at the University of London, and stayed on at his college until he had taken degrees in both medicine and surgery.

When, as a young house surgeon, he went into a London hospital, he was appalled by the number of deaths that came from "hospital sickness," or gangrene. As we have told you in the story of the Great Doctors, a large percentage of patients died, who had undergone successful operations, and all the surgeons were in despair. Young Lister believed from the first that some means could be found to stop the cause of all

which cause gangrene could not grow in a wound unless they had been carried there. At first he believed that they came from the air, so he searched for an agent which would exclude air from wounds, and for this purpose he at first used carbolic acid to form a crust over the wound. Carbolic acid is a powerful antiseptic. It kills microbes and destroys the poison that they produce. But its action on flesh is very severe, and although by its aid wounds were healed without danger of gangrene, it left ugly scars. Therefore, instead of applying the acid direct to a wound, Lister began to use it as a spray, and through various steps he was led to the belief that the use of carbolic acid



was not necessary. He learned that the microbes in fresh, pure air do no harm to a wound; it was the microbes carried to it from the hands, the clothing, the bandages or the instruments used in an operation that did the mischief.

Thus he laid the foundation for what is called aseptic treatment. That is, antiseptics, or microbe-destroying substances, are not applied direct to the wound. They are sometimes used on dressings, and by their use, and the use of great heat, sponges, bandages and instruments are made sterile.

From Glasgow, Doctor Lister went to Edinburgh University, where he succeeded Professor Syme. He stayed in Edinburgh for about ten years, and was then called to the College of London, where he was professor of surgery for nineteen years. In 1896, when he was an old man, he gave up his professorship; but went on with scientific study to the end of his life. Some time before he retired, he was made Sir Joseph Lister; a short time afterward he was made Lord Lister, and in 1895 he was elected president of the Royal Society, an honor that is shown only to the most distinguished men of science. He died in the year 1912, at the age of eighty-five.

#### THE MAN WHO FOUND X-RAYS

If you break your leg or your arm, or hurt yourself in some other way in the playing fields or gymnasium, the doctor will probably have an X-Ray picture taken so that he may be able to see what injury has been done to the bone, or if you have an aching tooth, the dentist will probably have an X-Ray picture taken to find out why it aches. These X-Ray pictures are wonderful things, but they have become so familiar to us that we have almost ceased to be curious about them. We are still less curious about the man who discovered the X-Rays. Nevertheless, he was a great scientist, and he has helped the work of doctors so much that he has a place here.

William Rontgen was born in Germany, in the year 1845, but was educated in Holland and at the University of Zurich, where he received his doctor's degree at the age of twenty-two. At the university he had turned his attention chiefly to chemistry, and soon made a name for himself in this branch of science. After he took his degree he taught at

the universities of Wurzburg and Strassburg, and in 1879 was made professor of physics at Wurzburg. It was at this university that he made his great discovery. One day after he had been experimenting with a Crookes' tube, he found that he had photographed a key which had been enclosed in a book. This discovery led him on to many more experiments, and the result of his work and study was a knowledge of how to produce the X-Rays that physicians and surgeons rank next in importance to the knowledge of anaesthetics and antiseptics. They are used to treat some kinds of growths on the body which are very like cancer. By their use the doctors can tell whether a badly swollen limb has been broken or has only had a lesser injury. They can find out just how much harm has been done to the lungs by tuberculosis, and by making a patient swallow a particular drug which the rays will not pass through, they can in some way find out whether an illness, such as cancer, has injured the stomach or other parts of the body. The rays will show whether or not a bullet has lodged in a wound, and perhaps no one person can imagine all these mysterious rays have done to lessen the pain of treating the wounds received on the dreadful battle-fields of Europe.

#### DR. ROBERT KOCH FOLLOWED IN PASTEUR'S STEPS

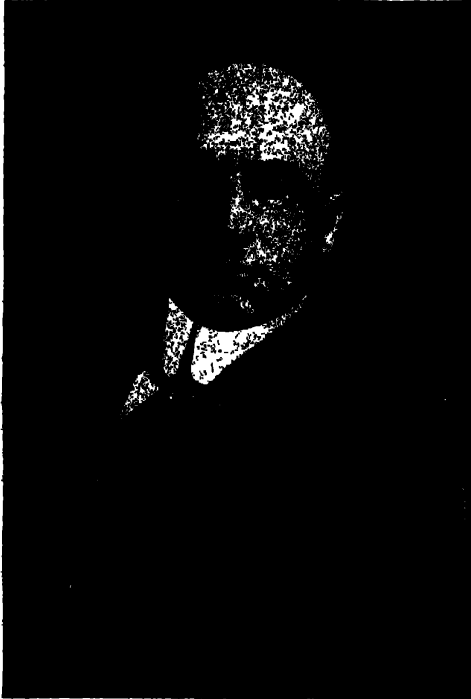
One of the greatest of the men who followed in Pasteur's footsteps was Dr. Robert Koch, a German scientist, whom we know best in this country perhaps by his efforts to overcome the plague of tuberculosis. Doctor Koch was a native of Hanover, and was born in the town of Klausthal, in 1843. He studied at the University of Gottingen, and some time after he took his degree, he went with the German army to France during the Franco-Prussian War. When the war was over he settled down as a country physician. But as he rode about over the rude country roads to see his patients, his mind was busy with many things. He took up Pasteur's work on anthrax and spent many a long evening over his microscope. Pasteur, as we have read, had discovered the microbe that caused anthrax, and learned how to prevent the disease. Koch learned the whole life history of the microbes, and thus taught scientists how to study all microbes.

## THE MAN WHO SAVED MILLIONS OF LIVES



It is probably no exaggeration to say that Lord Lister, the great English surgeon, saved millions of lives, for without his wonderful discoveries many of the operations that are performed in the hospitals of the world would result in death. He showed how the fatal poisoning of wounds, which nearly always followed operations before his time, could be avoided, and the whole world honors him for his splendid work.

He also did many things which it is interesting to us all to know. He discovered the microbe that causes cholera, the microbe that causes tuberculosis, and found out a way of preventing typhoid. After he had been made a professor in the Berlin University, men from all over the world went to study with him, and many of his students are now carrying on his work. One of these, a Japanese named Kitasata, found out the microbe which causes the bubonic plague, from



Dr. Alexis Carrel.

which so many millions of people have died in Eastern Asia, and which was responsible for what is known in European history as the "Black Death" of the Middle Ages. Doctor Koch went to Egypt to study cholera, and to East Africa to find out all he could about sleeping sickness and a cattle disease called rinderpest, of which we have read in another place, and he went to India to study the plague. He died in the year 1910.

**DR. THEOBALD SMITH HELPED THE WORK OF PREVENTING DISEASE**

He was helped in his work in typhoid and tuberculosis by the patient researches of Dr. Theobald Smith, who has done so many things and given so many ideas to other men that he might be called the

"Scientist's Scientist." Doctor Smith was born in the city of Albany, in New York State, in 1859. He went to Cornell University, and after his graduation there he took his degree in medicine at the medical college in his native city. The next year he received an appointment, from the Federal government, in Washington, and after a while was made a professor in a university there. While he was at Washington, he found out a great deal about cholera in hogs, and the result of his study laid the foundation for all that Koch and other men afterward discovered about the prevention of diseases like typhoid, diphtheria, and meningitis. Men and women who are likely to be in places where they may be infected by these diseases are inoculated with vaccines which make their bodies strong against these diseases, and this treatment, which has been given the long name of anaphylaxis, has saved many thousands of lives. Doctor Smith found out that the cattle tick, of which we read on page 3364, caused Texas fever. This was a great discovery, for it enabled the men of whom we have read elsewhere, to learn that mosquitoes are responsible for yellow fever and malaria, and the tsetse fly for sleeping sickness. He also discovered that tuberculosis in man is not quite the same disease as tuberculosis in cattle. Doctor Koch agreed with him in this and for a time thought that the milk of a cow who was ill with tuberculosis could not give the disease to a person who drank the milk, but unfortunately Doctor Koch was probably wrong, and at least it is much wiser to run no risk in such a serious matter. Doctor Smith is now at the great Rockefeller Institute, an institution in New York where a band of students are constantly at work striving to find out all about the human frame, and the enemies that attack it. At the head of it stands Dr. Simon Flexner, also an American, whose work is of particular interest to young people. For years he bent all the powers of his mind toward finding out the cause of infantile paralysis, which has hurt many thousands of children for life, and he found out that it is caused by the tiniest germ that ever has been known.

**DR. ALEXIS CARREL, THE GREATEST MEDICAL SCIENTIST OF OUR TIME**

One of the best known scientists of our time is Dr. Alexis Carrel, a French-

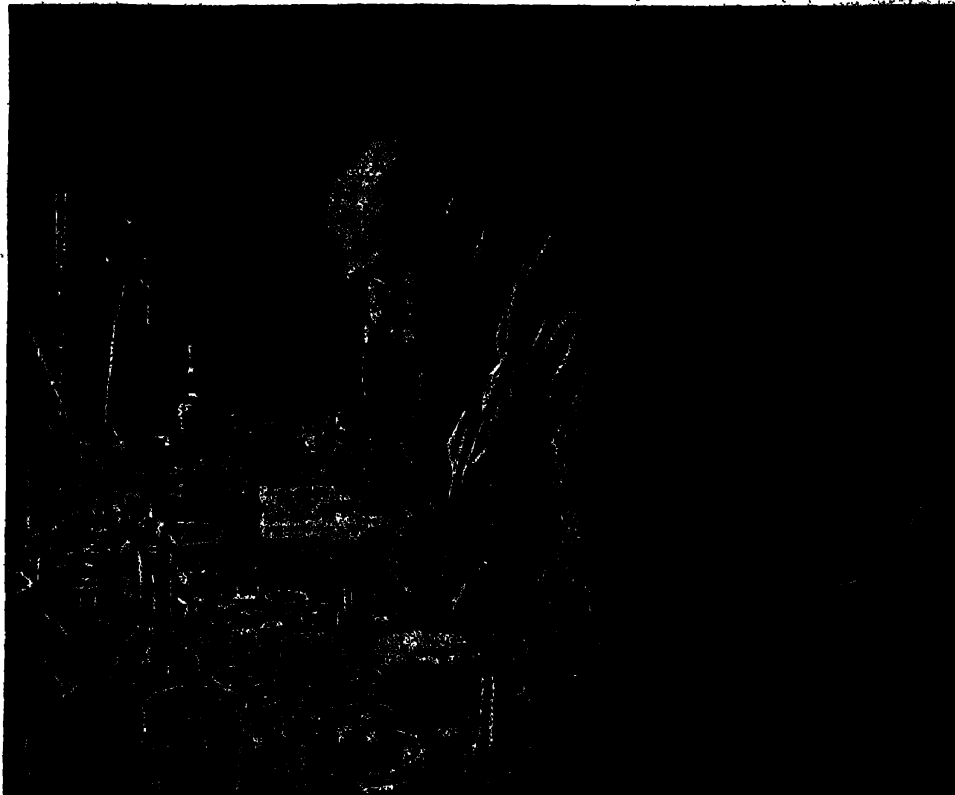
## SCIENTISTS WHO HAVE SAVED LIVES

man, who was born near the city of Lyons, in the south of France, where his father was a silk manufacturer. His school and college days were spent at home, and he graduated from the University of Lyons, where he took his degree in medicine in 1900. Five years later he became a member of the staff of the Rockefeller Institute, and much of his work has been done at that great institution.

It is difficult to tell of the work of this

bones from one part of the body to the other, and to perform many other wonders in surgery that have been done on men wounded in the Great War.

\*Now Dr. Henry Brysdale Dakin, who is not a doctor of medicine, but a doctor in chemistry and biology, had discovered that a solution of hypochlorite of soda will kill the microbes, or bacilli, as they are more often called, no matter how many there are in a wound. Doctor



Doctor Koch, the Discoverer of the Tuberculosis Germ, at Work in his Laboratory.

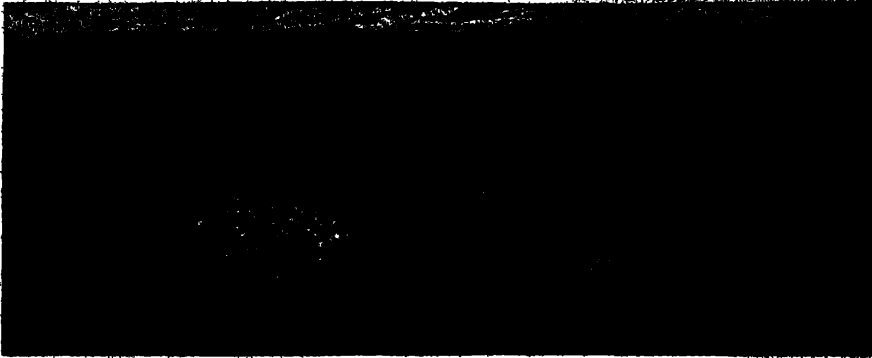
one man, it is so amazingly wonderful. Before his time, the flow of blood from an artery that had been cut could be stopped, but ever afterward the artery would be useless. Doctor Carrel found out a way in which the artery could be joined so that it would be able to carry on its functions as before. He discovered that as long as it can be kept alive, the stuff of which our bodies are built can be made to grow, just as microbes can be made to grow, and this makes it possible to take a vein from a part of the body where it has not much work to do and put it in the place of an important vein that has been destroyed, to transplant

Carrel learned of this treatment from Doctor Dakin, who was working with him among the wounded, and at once began to apply it. To make it successful, however, it is necessary to keep the wound always moist with the solution, and to keep the solution away from the healthy skin, which it would injure. So Doctor Carrel made a clever arrangement of tubes which run down from the jar of solution above the patient's head, and every two hours a nurse goes round the ward and lets the solution run down these tubes into the wound. When all the bacilli have been killed the wound heals up, and the patient quickly recovers.

## HOW A NEW POWER DAWNED UPON THE WORLD



This is a picture of Professor William Röntgen at the moment when he discovered that the action of the mysterious X-Rays, produced by electricity in the Crookes tube at the left of the picture, had actually photographed a key through a solid substance. He had laid a book, with the key closed in it as a bookmark, on top of a photographic plate. In the course of an experiment the X-Rays were produced, and the key photographed on the plate. This discovery has been of great service in surgery.



A hamster—a rat with cheek-pouches—enjoying its long sleep through the winter.

## THE WINTER SLEEP OF ANIMALS

A BUTTERFLY was born one day, and saw a world beautiful with sunshine and flowers and fruit. The air was sweet with perfume, the flowers were heavy with nectar, the world was a paradise for butterflies. And our butterfly danced and floated in the sunlight, and retired in the evening to the shelter of a splendid tree. The butterfly laid its eggs, and died. Its whole life lasted but a few days. To such a butterfly our world is always sunny and warm; always full of flowers and fruit. Now, how many of us realise that there are animals which live far longer than man lives—animals which know nothing but summer?

In a famous zoological garden an animal was shown, a few years ago, which had slept about two hundred years in all. The animal in question was an elephant tortoise, the age of which at the time of his death, was over 350 years. Now, he would sleep at least twelve hours out of each twenty-four during the summer. But that did not satisfy him. As soon as the dull days of autumn came, the tortoise puts himself to sleep, not for the night, but for the whole winter. And during all his long life—a life as long as the

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lives of six men—he never saw a winter. This tortoise was not different from the rest of his family. Every year he hibernates—that is to say, he passes the winter hidden away, and in sleep.

The long sleep of animals in the winter is one of the wonderful precautions which Nature provides for her children of the wilds. We might say that it is natural for a cold-blooded animal like the tortoise to go to sleep for the winter; that it is so sluggish an animal at the best that to change to a state of complete torpor or sleep is but a little step. But animals much more active than the tortoise go to sleep for the whole of the winter months.

When we read of travelers in the Arctic regions, we know that in the depth of winter they may come across the great Polar bear. Naturally, then, we say to ourselves that Polar bears do not hibernate. We are both right and wrong. Male Polar bears probably do not hibernate. They take their nightly sleep as we take ours, but they are always active in pursuit of food during the day. The mother Polar bear, however, goes to sleep for the winter. She lies down in the snow, and lets the soft, feathery mantle cover her.

Her warm breath keeps open a sort of funnel for her through which she can breathe. Far down in the snow as she may lie, there is always open a way to the upper air from which she can draw supplies of oxygen to keep her blood pure. And there, through all the winter days and nights, she lies. Winter comes and goes, and in due course the spring-time arrives. Then forth from her bed of snow comes the mother bear. And

trunk of a tree, or it may be some snug cave. All hibernating animals must, before settling down for the winter, find some suitable place. It would be of no use for them just to lie down the moment Nature told them that the hour was at hand for them to begin their winter sleep; they would die of cold, like ourselves, if they did not take precautions. They seek the right sort of shelter—some enclosed place, where the cold wind will not



A POLAR BEAR SLEEPING THROUGH THE WINTER

when she does come out, she does not come alone—she brings with her a baby bear, or, it may be, two baby bears, whiter and fatter and jollier than the finest Teddy bear that ever became lord of a nursery.

#### HOW BEARS PREPARE FOR THEIR WINTER SLEEP

But let us not forget that there are many other bears besides those of the Arctic regions, and many of these also hibernate. They do not bury themselves in the snow, but they find some other refuge. It may be the hollow

blow, and where the temperature will not vary. A mysterious knowledge which they have spurs them to do more than find out this shelter. As the autumn draws near, the bears eat and eat and eat, not because they are desperately hungry, nor because they are greedy. They eat that they may become fat. During the winter months, when they are lying asleep in their retreats, they require some sort of nourishment to retain life in their bodies. That nourishment they find in the masses of fat stored up in their bodies by the process

of heavy feeding which they have undergone in preparation for their long fast in the winter months.

The bear knows that he must be fat at the beginning of autumn when he tucks himself up in his cave or tree, or he will die, and so well does he understand this that, if times have been hard with him, and he has not put on a great mass of fat, he will not risk going off for his winter sleep. Woe to us if we come across him at such a time. We ourselves are bad tempered if we lose our sleep, but we are not as bad as the thin and angry bear which wants to sleep. That is the time when he is to be avoided. Another time is when he wakes up from his winter sleep. Then he is a bad-tempered fellow indeed. All the fat in his body has been absorbed during the winter; he is lean and hungry, and his fur is also matted and unlovely, and he is as much out of temper as any bear can be. But leave him alone, and he will come round. He will find roots, tender shoots of trees, honey, perhaps a few animals, and in a month's time his fur will have become sleek and fine.

#### THE RACCOON THAT SLEEPS IN A HOLLOW TREE

In the cold parts of the country the raccoon goes to sleep quite early in the autumn. He sleeps all through the coldest of the winter months; but very early in the spring he wakes up and leaves his hollow tree, even though the snow may still be deep on the ground.

The badger belongs to a species which, in cold lands, passes a good deal of the winter in sleep. In this it is like the brown bear. Brown bears and badgers partly hibernate—that is to say, they have long spells of winter sleep, without passing all the winter in this way. These animals now and again bestir themselves to go out and get food. Forth they go, get a meal as best they can, then return to their lair and sleep for weeks. Even the common hare

hibernates to some extent. It can sleep and snooze for days, or even weeks together, in the snow in the fields, and feel none the worse for the adventure. The scientist would not call this true hibernation, for the hare, like the Polar bear, keeps open a funnel in the snow by means of its warm breath. The scientist insists that an animal, to hibernate, shall be in a state of complete torpor; that it shall be to all appearance dead.

An animal in this state is one of the greatest mysteries in the world. The breathing practically ceases, the heart beats faintly; the temperature, or bodily heat, of the animal sinks to the temperature of the place in which it

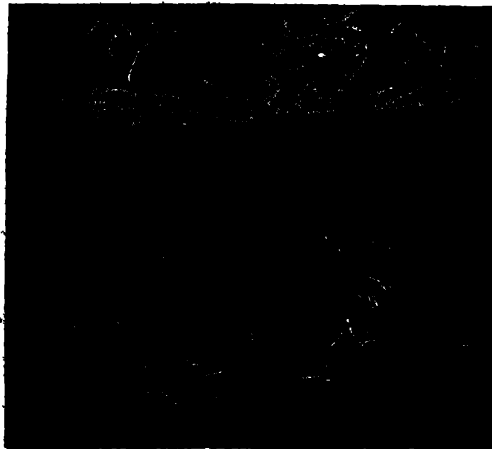
lies. Great cold numbs us, and makes us fall asleep—to die. But great cold awakens the hibernating animal. The sleeper is recalled to life, as it were, by a sudden fall in temperature, and if it is not able to move about and get food, or in other ways increase the heat of its body, it will die, frozen to death, like the weakest of us. A rise in temperature will

also recall the unconscious animal from its deep slumbers.

#### THE DEEP WINTER SLEEP OF THE BAT

The bats hibernate in the truest sense. If we were to take a bat when it is awake in the middle of summer and plunge it into water, we could soon drown it. But when a bat has fallen into its winter sleep we can place it in a bucket of water and keep it there for nearly half an hour, and it will know nothing about it, and be none the worse for the drenching. If the European hedgehog is disturbed while it is asleep in summer it will give a little snort or two, wriggle, then coil itself up tighter than ever, being quite awake.

When its winter sleep has started, however, we can do as we like to it without awakening it. It seems scarcely to breathe. When we try to rouse it, it will give one or two snores, then breathe



A BADGER IN ITS WINTER SLEEP



feebly a few times, and become as quiet as if dead.

It is said that in winter we might handle some deadly snakes without the least risk of danger to ourselves, but others, awakened from their torpor, would be as deadly as in the summer-time. There is plenty of opportunity for studying hibernation if we keep reptiles, for in cold climates they all go to sleep for the whole winter, provided that the conditions in which we keep them resemble the conditions under which these animals live when at large.

Numbers of rattlesnakes are often found in the winter closely coiled together as we see them in the picture in the story of the Great Snake Family. It is believed that they sometimes travel long distances to find a suitable cave in which to sleep. But who would care to handle rattlesnakes, even though they were asleep? Some of the deadliest vipers when aroused in the winter are said to be quite harmless; their "venom" is not poison at this time; but as other poisonous snakes are poisonous winter and summer, we should not care to experiment with the rattlesnake when he is waking up in a bad temper.

#### WHERE THE FROGS SPEND THE WINTER

We can get ample evidence as to the ways of hibernating animals from our common neighbors, the frogs. These sleep soundly through the most severe winter, but they are too wise in the

choice of their hiding-places for us to find them easily. When chill autumn comes the frogs betake themselves to their ponds, dive down to the bottom, and bury themselves in the mud. Should we by any chance come upon a hibernating

frog, he will swim lazily away, but will soon settle down again to resume the nap which we have disturbed. The freshwater tortoise buries itself in the mud of its pond. It is easy for any cold-blooded animal thus to pass the time in sleep. A reptile does not have to undergo so violent a change of tempera-

ture as a warm-blooded animal. A lizard makes itself at home for the winter in various places—under stones, among dead leaves, in holes and trees, and so forth. Land tortoises bury themselves for their winter sleep, and so do the common toad and the wood frog.

Lower in the scale of life we find the same habit practised. Slugs go to sleep in holes in the ground, and worms make their winter beds deep enough in the ground to escape the effect of frost, but in some places their sleep is not very profound. Snails, however, go into a very deep sleep, and they take a double precaution to protect them-

selves. They have their holes in the ground, but they are skilful enough to make a special protection for themselves. They close up the hole in their shell, but, as they must still have air, they leave open a tiny hole in this covering. It is hard to say how long



A young bat, life-size, picked up in the Surrey lanes at Ewell, near Epsom.



BATS DURING THEIR WINTER SLEEP

## THE WINTER SLEEP OF ANIMALS

they can support life in these conditions. A snail from Egypt, called *Helix desertorum*, lived, gummed to a board, for four years. It then revived, and lived in a museum for two years after awakening. Hence we need not be surprised to learn that fresh-water snails have the power of hiding away and remaining without food all the winter months. Some fishes hide themselves in deep holes or in the mud, and remain in a torpor while winter lasts.

Many insects hibernate. But here we come to a parting of the ways, as it were. Are we to call the life of the chrysalis during the winter a hibernation? Some insects lay two or three lots of eggs in the course of the summer. The earlier lots will all be hatched during the same summer, but the later will remain either as eggs or as chrysalises during the time

at the end of July, when their food is still plentiful. That seems unaccountable to us, but that there is a good reason for it we may be sure from the fact that year after year the bats retire at about the same time. Probably the reason is that they have had all the food necessary to build up their bodily strength; to continue to feed might be useless, perhaps even harmful. Some bats migrate southward, and so escape the colder climate of the north.

### WHY THE SQUIRREL MAKES A STORE OF FOOD

Let us glance at the methods of some animals that hibernate on less severe lines. Our pert and handsome friend, the squirrel, is one of them. We already know how he stores up food for the winter, then tucks himself up in bed and goes off to sleep. But warm days



A HEDGEHOG IN ITS WINTER SLEEP

of cold and absence of food. That is true of flies and many moths and butterflies. But we see butterflies on warm days in winter. True, there are some butterflies in temperate climates hardy enough to brave the cold days of winter. During frost and fogs and snow and rain they hide away in warm places, depending for life on the store of nourishment contained in their fragile bodies.

When the sun shines and the wind is warm, out they come, fluttering like winged sunshine in the wintry air. A very little suffices to feed them, and we are all glad, for the sight of a butterfly in winter is cheering.

It has taken the experience of thousands of generations to teach animals that it is necessary for them to go to sleep during the winter. Those animals which hibernate know their business better than we can teach it to them. Certain bats go off to bed for the winter



A DORMOUSE IN ITS WINTER SLEEP

of winter wake him up, or the action of his heart and muscles, which consume the fat stored in his body, does so. He wakes up, pops out to his store of nuts, and makes a good meal, then curls himself up for another long snooze in his delightfully warm little abode.

It is said that some of our marmots actually make hay and store it in summer, so that they may have abundant food during the winter. There are many species of marmots, and we can find something to admire in the wise ways of each. Those whose homes are in Europe and India make but little preparation, for they know that they will be able to leave their underground towns early in spring, and come out for food. Others lay up store for a long stay underground, so that as often as hunger awakens them they may have sufficient food in their little barns without having to go out and face the cruel weather. The woodchuck,

the best known of our marmots, makes no provision for the winter. He comes out of his burrow quite early in the spring time, and an old superstition says that if he sees his shadow, he goes back to sleep for six weeks more, knowing that the warmth will be slow in coming. Of course there is no truth in this old story.

The chipmunk or ground squirrel knows that winter is a hard time, during which he must shut himself up in his subterranean city. How well he provides against that time we may know from what was found in the winter home made by four chipmunks. There was a quarter of a pint of wheat, a quart of nuts, a peck of acorns, two quarts of buckwheat, a lot of corn, and a quantity of grass-seed. And this was to feed four fat chipmunks in the little intervals of wakefulness throughout the winter. Need we wonder at all that when they come out from their long winter sleep the chipmunks are as fat as butter?

#### WHY THE ANIMALS HIBERNATE

It is from necessity, then, not from choice, that the animals of which we have been talking take these long winter sleeps. Long as it has taken them to learn that they must accustom themselves to such a mode of life, they very soon shake off the attractions of a winter-long sleep if their conditions of life alter. We can keep a frog awake all the winter. We have only to keep him moist and warm and feed him, and he will not want to sleep night and day.

We know that men kept in a temperature equaling that of their own bodies, and doing nothing, can go without food for a long time. It is only at the beginning that hunger and thirst are felt; afterwards there is generally only a desire to sleep. Of course, if a man were moving about, or doing work, he would soon die; but keeping still in a warm place with pure air, a man can live many days without food or water. If a man can do this, we need not be surprised that cold-blooded animals like reptiles and amphibia and fishes can pass a winter without food.

#### THE BEAR THE ONLY FLESH-EATING ANIMAL THAT HIBERNATES

It is not so easy for an animal which needs occasional meals to hibernate. It is hardest, of course, for the flesh-eating animals. They have never yet learned

to store up food for the winter, except in the case of the Arctic fox, which does hide the bodies of captured animals, to be eaten when he wakes up now and again during the winter. It is wonderful that even a little animal like the Arctic fox should be able to make this provision. Of course, it would be impossible for a great bear to lay aside enough to keep himself fed during a long winter. He knows that, so he goes to sleep entirely, and eats nothing, making himself, by so doing, one of the greatest wonders of animal creation. Hibernation is a fascinating subject, and there is still a great deal to be learned about it.

#### ANIMALS THAT SLEEP THROUGH THE SUMMER MONTHS

The summer sleep of some animals is not such a simple matter for us to study. We have all noticed that on a hot summer day a heavy, drowsy feeling steals over us, and old people usually go to sleep during the afternoon. Sitting in front of a hot fire on a winter afternoon or evening will also have this effect. Well, the same sort of thing happens to animals, but with them it is a sleep for a season. Reptiles are most commonly affected in this way. The crocodile makes himself a bed deep down in the mud, and lets the sun bake the latter into a hard crust round him, and there he stays until rain comes to swell the river in which he makes his home. Then he breaks out of his muddy cradle, and is alert and hungry.

Snakes hide themselves in the same way, but let us beware of disturbing one. But the sleep during summer is not confined to the reptiles; the mud-fishes make a place for themselves in the mud. The water of the river dries up; the mud hardens until it is like stone, but the fish lies asleep inside, absolutely unharmed. And while it is in that state we can dig it up in its muddy case and bring it over the ocean, and wash it out of its earth into a tank in one of our conservatories, and it will live and flourish.

It is necessary that some animals should go to sleep to avoid the hardships of winter; it is just as necessary that others should sleep during the scorching heat of summer, for the blazing sun of tropical lands burns up the vegetation, and dries up the streams, so there would be nothing for them to eat if awake.



The Cullinan Diamond, and the Largest Stones Cut from It.

## THE PRECIOUS STONES

**WHAT** is your birthstone?

If you were born in January, do you wear a garnet? Do you know the origin of birthstones, and the difference between the various stones? If not, then tuck yourself into a big chair by the fireplace, and read this story. Of course we shall have to start out saying, "Once upon a time," for that is the way stories begin.

Once upon a time, long ago in the first century, a writer, Josephus, told about the virtues of various stones, and described the breast-plate of the high-priest which is mentioned in the Book of Exodus (Exodus 28, 17-19). The stones in this breast-plate were set in four rows, with the names of the children of Israel engraved, one on each stone. The modern names of these stones are generally thought to be the following: carnelian, chrysolite, emerald, ruby, lapis lazuli, onyx, sapphire, agate, amethyst, topaz, beryl and jasper. The breast-plate had not only these twelve magical stones for the twelve tribes, but also the twelve signs of the Zodiac.

Perhaps the custom of wearing birthstones grew out of this, for some of these stones are still used in this way. It is only recently that people have thought about wearing birthstones, and the custom is supposed to have started in Poland among Hebrew gem-

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traders, though no one knows just who chose the gems for the different months. It is an attractive idea, for the stones are durable, and the sentiments attached to each have been handed down for many years, and by many races and peoples. The lists have differed from time to time and in different places, but the one given below is now generally accepted.

### STONES FOR EVERY MONTH IN THE YEAR

There is at least one stone for each month, and each has a special meaning. For March, June, August, October and December, there are two stones. The garnet is for those born in January. Its meaning is constancy. The violet amethyst is for February, and is said to bring contentment to the wearer, and is the stone for sincerity. March is one of the five months which is favored with two stones. For this month we have the bloodstone, which means courage, and the aquamarine as second choice. Those born in April should wear a diamond, which typifies innocence. For May we have the emerald, and the wearers of this stone are supposed to be successful in love. June claims the pearl, which stands for virtue and health; and also the moonstone, which brings good luck.

Those born in July should wear the brilliant ruby as it brings nobility of

mind. August claims both the sardonyx, which prevents misfortune, and the peridot. To those born in September, the sapphire brings success and prevents evil. The opal, once called a bad luck stone, is now supposed to bring happiness and wealth to those whose birthday comes in October. The tourmaline is also a birthstone for this month. November has the yellow topaz, which stands for friendship and success. December is favored with two stones—the turquoise, which is said to prevent accidents, and the lapis lazuli.

#### HOW STONES ARE CUT INTO THE FORMS WE KNOW

Before going on to describe separately each stone in our list let us learn something of the way stones are prepared for us. Very few stones are set as they are found, because they need to be cut and polished to show their beauty. Otherwise they might seem dull, irregular and opaque. The practice of cutting stones is very old indeed. The Phoenicians may have learned the process from the Assyrians. Stones may be cut in many different forms, as the cabochon, table, step, rose or brilliant. They may be cut in curved surfaces like the star sapphires, or cut in facets (small faces), like the diamonds. Before the fourteenth century they were usually given curved surfaces; later the transparent gems, except the garnet, were cut with facets. When the garnet was cut with curved surface it was called a carbuncle. Many of the opaque and translucent stones are cut "en cabochon," that is, with smoothly rounded tops, as opals, moonstones, and turquoises.

Diamonds are sometimes cut in rose pattern, that is the facets are triangles of nearly the same size. When cut in this way the diamond is not so beautiful, and has little fire. Therefore, only the less valuable stones are cut after this fashion. The table or Indian pattern is used especially for emeralds, rubies and sapphires. The top and bottom of the stone are ground off, and its sides are so ground that the finished gem resembles two pyramids with the apexes flattened, placed base to base. The flat top is called the table and the bottom the culet. The widest part is called the girdle. Years ago, diamonds were cut in this way.

The cut which gives the greatest brilliancy, is called the brilliant. It has fifty-eight facets, thirty-three above including

the table, and twenty-five below the band or girdle around the stone at its widest point. The setting grasps this girdle and holds the stone in the ring, pin or pendant. The facets are of various forms and sizes, and have different names, as star, skew, and the like. It is said that the art of cutting diamonds into facets was discovered in 1456. If there is a flaw, that is a dull spot, in the rough stone, it may be possible to split or saw it off. The stone is then gradually rounded by rubbing against another diamond, and the fine powder and fragments that result are carefully saved for use in the final polishing.

The next process is that of cutting the facets. This work requires great care and skill. The stones are nearly buried in soft metal, and the parts left uncovered are rubbed against each other. The hands of the workers are protected by leather gloves. First the top or table facet is made, then the culet, or flat bottom facet, is formed. The long facets extending from the table to the edge are next fashioned, and at last the small facets.

Then comes the polishing against an iron wheel with diamond dust and oil. This operation is very slow, and a moment's carelessness may ruin a fine stone. When finished the stones are sometimes boiled in sulphuric acid to remove any bits of dust or oil. Only very skilled workmen can attempt the difficult task of cutting a valuable diamond.

#### WHAT IS MEANT BY THE WORD CARAT?

Do you think a carat is a vegetable? It is not even related to the carrot, though they sound very much alike. The carat, as a weight, is used for weighing precious stones. The word carat is said to come from the name of a bean, which was once used in the East as a weight. Nowadays jewelers do not use the beans, but the word carat is still kept. A little more than 151 diamond carats make an ounce. There is another kind of carat used in measuring the fineness of gold. It is a twenty-fourth of an ounce. If your ring is marked eighteen carat, it means that eighteen parts are pure gold and six parts are of some other metal.

#### IMITATION AND ARTIFICIAL STONES OF DIFFERENT KINDS

Perhaps you have seen in cheap shops rings or pins with glittering stones, which

are offered for a low price. Of course, you know that such stones are not real. They are generally made of various kinds of glass and soon grow dull. We know, however, what chemical elements are found in all the real stones, and men have tried to manufacture them. In some cases they have had success. They put the different things of which the stone is made into a furnace and melt them together. If done very carefully, in some cases they get a stone so nearly like that found in nature that only an expert can tell the difference. Excellent rubies can be made in this way. Men have also succeeded in making diamonds, but they are very small and cost more than the natural stones.

A doublet is an imitation stone made up of two parts—the top part consisting of a thin layer of a real stone of little value attached by cement to the base, which is made of nothing but colored glass. A doublet sapphire, for instance, would have the top a real stone, and for the base, a piece of blue glass. The upper part, as it is a real stone, will stand the test for hardness but the base shows its softness.

The triplet has a thin layer of a real stone on the top and on the bottom, too, but a piece of colored glass is inserted between at the girdle, where it is hidden by the setting. This imitation may be discovered by putting the unmounted stone in oil, or in boiling water or alcohol, when the stone will fall to pieces:

Imitation pearls can be made of small hollow glass beads formed by blowing. These blown pearls are coated on the inside with a preparation, called essence de Orient, made from the scales of a certain fish. Some imitation pearls are composed of a solid glass ball coated with a varnish, and they are very beautiful.

#### **THE GARNET, THE STONE FOR THOSE BORN IN JANUARY**

The garnet, which is the birthstone for January, is usually a dark-red stone, but it may be yellow, green, brown, or even black. It varies in hardness and in size as well as in color, for some stones are like a grain of sand, while some are much larger; some of them will scratch a piece of quartz; others may be scratched by quartz; some are opaque, and some are transparent. The name comes from the Latin, *granatus*, meaning seed-like, because the stone resembles the seed of the pomegranate.

If you find a stone which is roundish, and of a reddish color, you may rightly think that it is a garnet. The little crystals which make up the stone, but if you dig several perfect ones out of the rock you will notice that they have smooth faces. Sometimes they will have twenty-four faces. When rocks decay the garnets that are contained in them fall out and are washed into the streams. Garnets are as hard as quartz, and can stand being thrown about by the waves. The little red stones you may find are not the precious ones. The clear red garnets come from Bohemia, Ceylon, Peru, Greenland and the Cape of Good Hope. In America, some stones have been found in New Mexico and Arizona.

Garnets are something like the ruby, though cheaper, and were called by the ancients, carbuncles. When they are cut like the half of an egg, they are still called carbuncles. The stones are often so beautiful that they may be cut into gems of two or three carats each.

#### **THE AMETHYST, WITH ITS VIOLET COLOR**

The amethyst is a variety of quartz, and varies in color from a light bluish-violet to a clear dark purple, and sometimes is nearly black. The dark reddish-purple is the most highly prized. Amethysts have been found in many parts of the United States, but the best stones come from Brazil and Ceylon. Those found in Yellowstone National Park, in the Amethyst Mountains, Texas, in parts of North Carolina and Georgia are the best in this country. The value of an amethyst depends somewhat upon the fashion, for at times these stones have been considered very valuable.

#### **THE BLOODSTONE, FOR THOSE BORN IN MARCH**

If you see in a store window a ring with a queer-looking green stone with dashes of red, you may wonder what it is. Probably it is the bloodstone, a variety of jasper containing red streaks. This stone was used as a talisman by the ancient Egyptians and Babylonians. Now the stone is used especially for signet-rings. The Spaniards used to cut the bloodstone into a heart-shaped amulet, because they believed that it was a remedy for heart trouble.

The bloodstone, or hellotrope, as it is sometimes called, comes from Siberia and also from some parts of the United States.

especially Georgia, Oregon and California. In very ancient times, it was used for the engraving of sacred subjects. The figure was so placed that the red spots were made to represent drops of blood. It is sometimes called St. Stephen's stone.

**THE AQUAMARINE, ALSO A STONE FOR THOSE BORN IN MARCH**

If you should find a piece of a green glass on the beach, it might be merely a part of a broken green bottle, or it might be a real stone which is called aquamarine because it looks so much like the greenish-blue color of the sea-water. It is really a variety of beryl. Aquamarine is found in many different localities, but most of the best gems have come from India, Russia, South America, Siberia, and Ceylon. Aquamarines of various hues have been found in the United States, especially in California, North Carolina, Massachusetts, Maine and Connecticut. Possibly the largest and finest aquamarine ever seen was found in 1901 by a miner in Brazil. This stone although it shows shades of green and blue is so clear that one may look through it as though it were a piece of glass, and yet it is a big piece of crystal, nineteen inches long, weighing 243 pounds.

**THE DIAMOND, THE KING OF PRECIOUS STONES**

An uncut diamond is not beautiful; in fact it resembles a rough gray pebble. The diamond is composed of only one element, pure carbon, a very common substance. It is surprising to find that the coal in the grate, and graphite in the lead pencil, are exactly the same thing chemically as the diamond, but the crystals are arranged in a different way. The diamond, the emblem of fearlessness, has been called the "king gem;" the pearl, the emblem of modesty and purity, has been called the "queen gem." In the Sanskrit, the diamond is given names meaning thunderbolt, fire, and the sun. In the Greek, it was called "adamas," unconquerable, from which word comes our word adamant, meaning hard.

The three important sources of supply are India, Brazil and South Africa. Up to the sixteenth century, India was the exclusive home of the diamond. Recently it has been found in the United States, but most come from South Africa. Diamonds are grouped under different names according to their color. The most valuable ones are those said to be of "the

first water." The blue, hope, and pinkish diamond is probably the most celebrated colored diamond, but rose, black, green, mauve and salmon shades are also known.

A file cannot scratch a real diamond, though it will affect an imitation. A diamond will show up very clearly if placed in a glass of water, but an imitation will look dull. If you hold a diamond over a black dot on a piece of white paper, the speck will show clearly. If the dot is blurred or is multiplied, then the stone is not genuine. There are other tests, but the supreme test is its hardness, for the diamond is the hardest stone.

**THE BEAUTIFUL GREEN EMERALD FOR MAY**

The emerald is a grass-green variety of beryl found especially in Colombia, South America. It is also found in Egypt, Russia, Australia, and some have been mined in North Carolina. In Mexico, the emerald was given the name "quetzalitzli," meaning the stone of quetzal, because its beautiful green color resembled the golden-green of the Mexican bird, the quetzal, sometimes called the long-tailed paradise-trogon. The plumes of this bird were often worn by the rulers in Mexico and in Central America, and so the emerald came to be regarded as a royal gem. We are glad we have a name for this stone that is not so odd as the Mexican name.

Some people used to think that the emerald was a charm against illness if it was worn as an amulet around the neck. One of the most celebrated rings in history was a large emerald set in gold and worn by Alexander the Great, who had his portrait engraved on the stone. The very finest emerald in Europe now, belonged to the former Emperor of Russia. A perfect emerald is rare, and so is worth as much as a diamond of the same weight.

**THE PEARL, THE QUEEN OF GEMS FOR JUNE BIRTHDAYS**

If you are eating oysters on the half shell and find some day a dainty little silvery pebble, you may have found a real pearl, though it is not likely to be worth much, as the best come from a kind of oyster which is not good for food. Something that does not belong there, perhaps a parasite or a tiny speck of sand, gets inside of the shell. The oyster tries to cover it over. This covering of nature or pearly substance is the same material

used in lining the shell. Most pearls are white or cream-colored, but some are found having a gray or even a pink shade, and others are rose-colored. You may read about pearl fishing in another volume of our book.

Although the pearl is not a stone, it is classed with the most valuable of precious stones. It is very delicate and loses its beauty if carelessly handled or exposed to great heat. When it is placed in cold storage for safekeeping, it should have a piece of damp sponge near it. If a pearl is cut across the middle and examined under a microscope, it will show a number of layers or rings, and so resembles an onion in structure. Pearls vary greatly in size and shape. Some are shaped like a button, others are pear-shaped, but the best are perfectly round like a ball. Pearls were known to the Greeks and Romans long before the diamond was known. A beautiful white pearl called the "Pelegrina," as large as a pigeon's egg, weighing 134 grains, is now in Moscow. The largest pearl known is in the South Kensington Museum in London and weighs three ounces. A very rich man in this country owns a string of thirty-seven pearls which cost over \$40,000.

The pearl oyster grows in warm waters in many parts of the world. The finest pearls come from the fisheries of Ceylon, but they are found around islands in the Pacific and Indian Oceans, in the Gulf of California and in the Caribbean Sea. Some of the mussels in the streams of the United States yield "fresh water pearls" which are beautiful but not so valuable as the real pearls from salt water.

#### THE MOONSTONE, THE SECOND STONE FOR JUNE

In India the moonstone is considered a sacred stone, and is supposed to bring good fortune. Whenever it is displayed for sale there, it is placed on a yellow cloth, as yellow is a sacred color. Nearly all the moonstones come from Ceylon. In Colombo, moonstones may be bought for a few pennies each, as they are very common there, but in this country they are valued much more highly.

The moonstone, which is a variety of feldspar, has a milky blue color, and a soft lustre, and is usually cut "en cabochon" with a rounded top, or cut in the shape of a ball. There is an old superstition that says that a moonstone held in

the mouth will help a person to remember things which he had forgotten.

#### THE RUBY, WHICH GLOWS FOR JULY

The ruby, the birthstone for July, when fine and large, is the most valued of all stones. The very name of the ruby, called in the Greek, "live coal," in the Latin, rubeus, or red, indicates its color, a vivid red, which sometimes has a tinge of purple or a pale rose-red.

Most of the real rubies have come from Upper Burma. A few have come from the gem sands of Ceylon; some are found in Siam; others come from Madras and Mysore, India; and a smaller number from Afghanistan and Australia. Those in the United States have been found in North Carolina and Montana. The oriental ruby is often mentioned in Eastern legends and old romances. Several stones which are not rubies at all have been called by the name. Though so much valued it is the stone which can be made artificially with the greatest success. Most of the artificial stones show tiny bubbles, if they are examined closely.

#### THE SARDONYX, WHICH BELONGS TO AUGUST

The sardonyx, as its name indicates, is composed of layers of sard and onyx. The layer of sard is of a deep brown or reddish color, while the onyx should have the delicate pink color of the finger-nail. These stones are often used for cameos. One of the most famous stones in the world is a sardonyx cameo upon which Queen Elizabeth had her portrait cut, and which she gave to the Earl of Essex as a pledge of her friendship. When sentenced to die, Essex sent this stone to his cousin to be delivered to Elizabeth. Through some mistake the stone reached the hands of the Countess of Nottingham, an enemy of the Earl, who refused to deliver the ring, and as a result the Earl was beheaded.

#### THE PERIDOT, THE ALTERNATE STONE FOR AUGUST

The beautiful olive-green peridot is sometimes called "chrysolite," meaning golden stone, or "Job's tears," from its shape, and sometimes it is called "evening emerald," because of its bright green color at night. The stone is usually cut "en cabochon," but a "table step-cut" form is considered more valuable. As the stone is rather soft and easily scratched, it is not so often worn in rings as in pins.



Most of the best stones come from a little island called St. John on the west coast of the Red Sea. A few very fine peridots were found not long ago in the ruins of an old house in Alexandria, where they had probably been buried with the idea that they would bring good fortune to the building. Some light-green stones come from Queensland, and some bits of peridot have been found in the United States.

**THE SAPPHIRE, GENERALLY BLUE, BUT SOMETIMES YELLOW OR WHITE**

The sapphire, the birthstone for September, is the symbol of truth and virtue. This royal stone, the "gem of gems," as it is called, has always been popular with lovers of precious stones, because of its beautiful blue color. Most sapphires are of a clear blue shade, varying from a pale blue to a deep indigo. We may, however, see some stones which are white, some which are yellow, and even some of a greenish-blue hue. Except in color, the sapphire is like a ruby. Both stones are composed chiefly of a substance called alumina. The stone does not show up very well at night.

Ceylon is famous for sapphires. In the United States they have been found in Montana and Idaho, but the largest number of these stones come from Siam, which supplies more than half of the world's sapphires. In Siam the stones are found in clay which contains gravel, and usually at a depth varying from two to twelve feet. The gravel and sand containing the gems is carried to a stream in large bamboo baskets, with a point at the bottom. The basket is then placed in a current of water, and its contents carefully washed, until the clay has been separated. As the gems are heavier than the common stones, they settle at the bottom of the basket, and are then picked out by hand. Garnets and zircons are often found near the sapphires.

**THE OPAL, ONCE THOUGHT TO BRING ILL LUCK**

The opal was the favorite stone of Queen Victoria, and she always loved this white fire-flashing stone, the symbol of hope. This gem shows many colors: the green of the emerald, the soft purple of the amethyst, the red of the ruby and the blue glints of the sapphire. The play of colors in this stone is caused by tiny fissures crossing in all directions, and is not due to any coloring matter, as in the

case of nearly all other colored precious gems.

Most of the opals come from Hungary, but some are also found in Australia, Ceylon, Iceland, the Hebrides, Ireland, Mexico and the United States. It is said that when the opal is first taken from the mine, it is colorless and transparent, but after it has been kept in the light for a time, the violet shade appears, followed by the other hues.

One very famous stone was called the "Burning of Troy," on account of the tiny tongues of red flame it showed as if it was on fire. There are some very fine opals from Hungary among the crown jewels of Austria, and the crown jewels of France. Recently some very beautiful black opals were found on Lightning Ridge in a desolate part of Australia, called the "Never-Never Land." No two of these stones are exactly alike. Some show flashes of blue glowing flame, others have intricate patterns of molten green and twinkling red. A stone which appears to have dancing flakes of sapphire blue, when turned to another position in the light will show flashing gleams of yellow and red. As they are rare, the black opals are very expensive.

**THE TOURMALINE, WITH ITS MANY COLORS**

If you saw a piece of tourmaline in the granite home where it lives, you might think that it was a stick of pink candy. But tourmaline is not always pink, for it sometimes has almost as many colors as the rainbow. Some varieties are brown, some are red, some are blue and some are even black. In the stones found in Brazil, the core is often red, surrounded by white, with a green shade on the outside. Specimens from the mountains of Southern California show a green core, surrounded by white, with red on the exterior, which is just the reverse of the Brazilian stones. Delicate shades of green, violet and brown are sometimes combined in specimens from Ceylon and Pegu. The island of Elba produces a variety of tourmaline whose crystals are black at one end, red at the other, with yellow in the middle.

The tourmaline is found in many parts of this country, especially in Connecticut, Vermont, and New Hampshire. It was first found in Maine by two boys who were interested in minerals. They were coming home from a walk when they

saw something green near the foot of a tree. They picked up a few pieces of this green stone, but as the snow was falling very fast, they returned home, and later came back to the spot, where they found a number of very beautiful crystals. This mine is like an Aladdin's cave, for over forty varieties of this stone have since been found there.

There are several varieties of the tourmaline: the rubellite, a pink or red shade; the indicolite, a blue color; and the achroite, which is colorless. When cut into settings for rings, the red tourmaline looks so much like a ruby that it is often mistaken for one. One of the Saxe Holm stories tells of finding a wonderful tourmaline.

### THE TOPAZ, THE STONE FOR THOSE BORN IN NOVEMBER

Yellow is the usual color of the topaz, but not all are that color. In fact, you will have no difficulty in matching a topaz with your dress, for the topaz is found in an almost endless variety of colors. The finest stones are of a bright citron shade, at times showing a clear gold color. Most of the gems come from Brazil, but they are also found in many other parts of the world, as England, Russia, Saxony, Australia, and the United States. Sometimes a large white topaz is mistaken for a diamond, and the crimson topaz has been substituted for a ruby, while the green shade has been called an emerald and the blue shade has been mistaken for a sapphire.

The largest topaz on record was found in Brazil a few years ago, and weighed in the rough state eleven and one half pounds. It took several months to cut this huge stone. The Maxwell-Stuart Topaz is a stone which was first thought to be a piece of quartz, but later proved to be a topaz weighing 308 carats.

### THE TURQUOISE, WHICH MEANS THE TURKISH STONE

The turquoise has been praised by many poets. We may remember, in Shakespeare's Merchant of Venice, when Jessica goes away with her father's jewels, old Shylock grieves greatly over the loss of his turquoise, which he would not have lost for "a wilderness of monkeys."

Centuries ago these stones were mined by the Egyptians in the desert of Sinai. They were found in Mexico before the discovery of America. A great many are now cut in America and shipped to

Europe. The best turquoises come from the northeastern part of Persia, where the mines have been worked for thousands of years. The name of the stone indicates that it came from Turkey, as the finest kinds came from Persia by way of Turkey. The beautiful blue turquoise is supposed in Tibet to bring good fortune and to guard against the "evil eye," and is thought to change its color and grow pale in sympathy with the health of the wearer.

The turquoise is similar to the opal. Like the opal, it is found filling up cavities in the interior of rocks. Some beautiful stones of robin's egg blue and some of green, as well as azure, have recently been found in New Mexico, Arizona, California, and Nevada. Now imitations of beautiful blue color have been made and they can hardly be detected without destroying the stone.

### THE LAPIS LAZULI, THE SECOND STONE FOR DECEMBER

The lapis lazuli, or azure stone, is a rich blue stone which shows specks of iron-pyrites of golden hue, and is far more intense in color than any other opaque blue stone. For many centuries this stone was considered very valuable and was prized especially for its color, "blue with golden spots." By the Greeks and the Romans, this stone was known as the sapphire. Pliny called it the "blue sky flushed with stars." It is not always a deep blue shade, but varies from a pale blue or greenish to a pure green. The best come from Afghanistan, on the Oxus River in Asia; although some stones are found in Persia and China. To obtain the stone, the rock must be split by fire.

### SOME FAMOUS STONES AND THEIR STORIES

In the Museum of Natural History, in New York City, there is a wonderful collection of over 4,000 specimens of gems, and every stone there has a special interest. In the display cases, one may see the most nearly perfect large sapphire known; the largest piece of gem beryl; the finest opal found in Mexico, which is a fire-opal of 17¾ carats; a garnet cameo, which was for centuries in the Vatican; a series of 166 sapphires in many colors, and many other large stones. There is a Persian turquoise engraved with a whole chapter of the Koran, containing over two thousand

words. In another case one may find specimens of the new stone, first found in California, in 1903, which has been called kunzite, for the gem expert, Dr. George F. Kunz.

The first native sapphire ever cut in the United States is also there. A large blue sapphire, weighing 163.93 carats, came all the way from Ceylon to find a place in the exhibit. The largest and most perfect star-sapphire known, showing the six-rayed refraction, may also be seen, and the famous "Star of India" sapphire, weighing 543 carats, has a prominent place. In the topaz section, there is a well cut gem of 615.90 carats from Ceylon. There are several specimens of amethysts from North Carolina and Maine, and a royal purple stone of 142.5-32 carats from the Ural Mountains. In the diamond series, there are several American crystals, one of 15.78 carats from Wisconsin.

In one room, one may see copies of the most famous diamonds of the world. One, the Cullinan, found in the Premier mine in the Transvaal, South Africa, in 1905, is the biggest stone known. The glass model of the Sancy shows the size of this stone, which is 53 carats. Other stones are the blue Hope diamond, which weighs 44 $\frac{1}{8}$  carats, and the Regent of France, which weighs over 316 carats.

#### STORIES OF THE FAMOUS DIAMONDS— THE ORLOFF

Large diamonds are very rare. In fact there are only about a hundred stones weighing over thirty carats in the world. Some of these big stones have had strange histories of romance and intrigue. The stone which is known as the Orloff was once an eye in the statue of a god in a Brahman temple in Mysore, but a French soldier, who was stationed as a guardian of the temple, picked out this beautiful eye, and ran away with it. It was stolen from him by another thief, the captain of an English ship, who disposed of it to a Jewish dealer in London. It was finally sold to Prince Orloff, who presented it to Catherine II of Russia. It was in the royal sceptre, and was prized as one of the most beautiful of all the stones in the world. It is about the size of a pigeon's egg, of a yellowish shade, and weighed 194 carats, and was valued at \$1,649,000. Since the Russian Revolution it has been lost to sight, though strange rumors about it have come to us.

#### THE HOPE DIAMOND, A BEAUTIFUL BLUE DIAMOND

This diamond is interesting as it is the largest blue diamond known. It is called the Hope diamond because it belonged to a famous banker by that name. It was really one of the most valuable diamonds in Europe, though it weighed only about 44 carats. Little is known of its early history, though some people suppose that it was stolen with other stones from the French crown jewels at the time the Regent diamond was taken. It was found again, and later shown among the French jewels at the London Exposition in 1851.

#### THE EXCELSIOR AND THE REGENT DIAMONDS

Before the discovery of the Cullinan diamond, the Excelsior, weighing 971 $\frac{3}{4}$  carats, and measuring two and one-half inches in length, was the largest stone known. The man who picked it up while loading his truck at the mine, was rewarded with \$2,500 and a horse and saddle. From this stone were cut twenty-one brilliants.

A large, round stone weighing 410 carats was found in an Indian mine in 1701 by a negro slave, who concealed the discovery and fled with it to the coast, only to meet with a tragic end, for on board the ship he was robbed and then thrown overboard. The captain who committed this double crime sold the diamond, and spent the money recklessly. The stone had a varied history until it was bought from a Parsee merchant by Thomas Pitt, the English governor of Madras, grandfather of the famous William Pitt. He sold it to the Duke of Orleans, Regent of France, for whom the stone was called the Regent. It was stolen in September, 1792, during the French Revolution, and buried with other valuable jewels in a ditch to prevent any one from finding it. Twelve years later, one of the robbers told of its hiding-place near the Champs Elysees, because he was afraid to offer the stone for sale. All the thieves were sent to the scaffold, except the one who told where it was hidden. This treasure, you see, has been the cause of much unhappiness as well as joy. It has been recut so that it weighs only 136 carats, and is now among the French state jewels. Some of our readers may have seen it when they were in Paris.

THE KOL-I-NUR, THE GREAT MOUNTAIN OF LIGHT.

The story of the Koh-i-nur begins as far back as the year 1304, when the Mogul emperor captured it. Though some people say that the stone can be traced much further back. This stone, which has been called "The Mountain of Light," is the oldest diamond that is known, although it is not the most valuable. For many years the stone passed from one ruler to another, and was the source of endless misfortune to its possessors. It may have been one of the diamonds in the famous Peacock Throne of Shah Jehan, the great Mogul sovereign. This throne of solid gold, valued at \$30,000,000, was so called from the figures of two golden peacocks, whose feathers were set in rubies, emeralds and other gems.

The Koh-i-nur was finally presented to Queen Victoria in 1850. It was badly cut at first, and its weight has been much reduced by recutting. It now weighs 102¾ carats. It took many days to cut this big stone. Now the stone is kept in Windsor Castle, and a model is shown in the Tower of London.

#### THE SANCY, WHICH HAD AN EXCITING HISTORY

The history of the Sancy, also called the Sphinx, is bewildering, as several stones have been called by that name. The original Sancy was a beautiful almond-shaped Indian diamond, covered all over with tiny facets, and weighed 54 carats.

It is impossible to follow the journeyings of this stone, for it had a habit of hiding away for long periods. It was said to have belonged to Charles the Bold of Burgundy, but it was stolen from him by a soldier, who prized the golden box in which the famous stone was kept. Thinking that the bright box was more valuable than its contents, he tossed the white stone in the road. After a time he began to think that the contents of such a lovely box must be of value, too, so he returned to the place where he had thrown the stone and picked it up. Not wishing to keep it, he sold the stone to a priest for a florin, which is about fifty cents, and the priest later sold it for about seventy-five cents.

For a hundred years the stone was lost to sight. Then it appeared again, and in the possession of Nicolas de Sancy. Queen Elizabeth is said to have owned it,

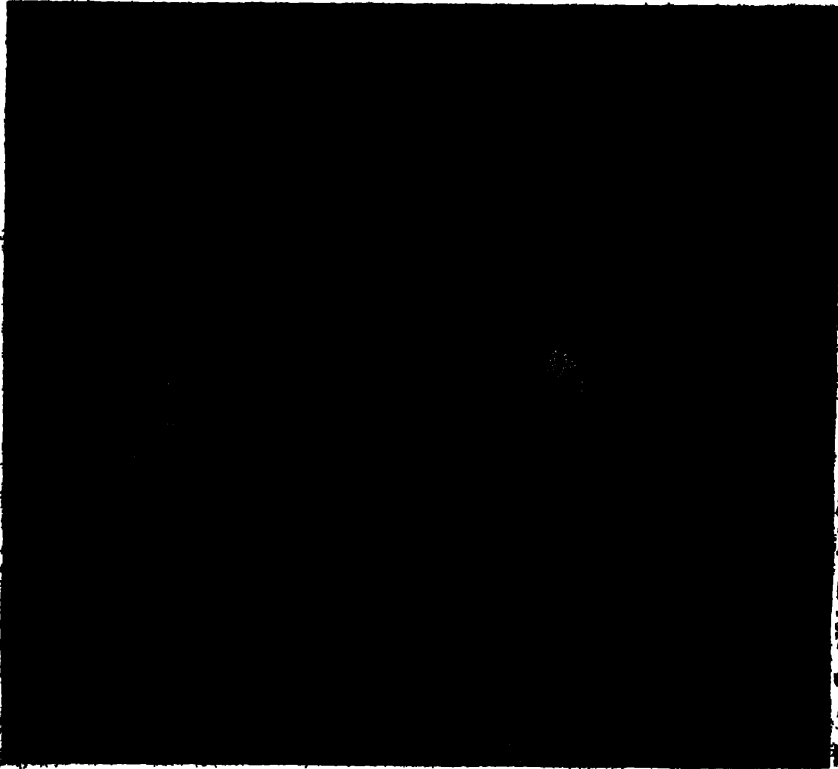
and she is said to have given it to Louis XIV. of France. The story of the Koh-i-nur is a long one, and the stone has been in the possession of many rulers. It is said that it is the same stone that was in the possession of the Mogul emperor, and that it is the same stone that was in the possession of the British government. It seems to be that the stone is the same stone, whether the same stone is the same stone or not. All of the stories seem to be true of one stone, and yet it is possible that there could be several diamonds so large.

#### THE CULLINAN, THE LARGEST DIAMOND EVER FOUND

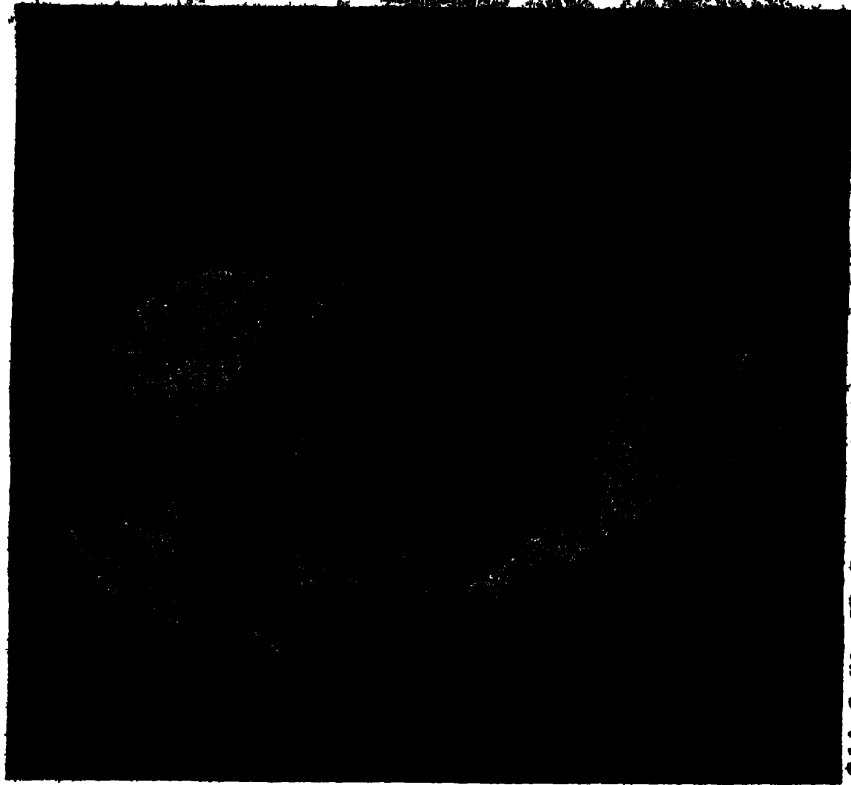
If you saw a stone the size of your head, you would not call it a diamond, would you? On the contrary, you might think it was merely a piece of ice, or perhaps a lump of quartz. You will not see a stone that size every day, for there has been found only one diamond as large as your hand and as heavy as a pound and a third of sugar. This huge stone, called the Cullinan, was three times as large as any known diamond, and weighed before cutting, 3,025¾ carats, and measured four by two and one-half by two inches. It was purchased by the Transvaal government for the sum of one million dollars, in 1907, and was presented to King Edward VII, of England, on his birthday, November 9, 1907. Three years after it was found it was cut in Amsterdam and divided into nine large stones and a number of small brilliants. Two of the stones, by far the largest brilliants in existence, have been placed, the one in the sceptre, and the other in the crown of the British regalia. At the head of this story we show the original stone, and the largest stones cut from it. The larger, known as Cullinan I, weighs over 516 carats, and the smaller, called Cullinan II, weighs over 300 carats. Some people believe that the original Cullinan was only a part of a much larger stone, which may be found some day.

There are many other large diamonds in existence, such as the Star of South Africa, the Stewart, the Porter Rhodes, the Tiffany, and the Jubilee, but none of these has a particularly exciting story. They are simply beautiful stones. One sometimes wonders how much diamonds would be prized if they were as plentiful as quartz. They are beautiful, to be sure, but would men and women wear them so proudly, and struggle so hard for their possession, if any one could get them?

# PRESIDENT HARDING AND VICE-PRESIDENT COOLIDGE



Warren-Gerrit Harding, President of the United States, was born at Corsica, Ohio, November 2, 1875, studied in Ohio Central College, at Lima, Ohio, became editor of the Marion Star, was a member of the Ohio senate, and lieutenant-governor. He became United States Senator in 1915, and was elected President in 1920. He died at Art College.



Calvin Coolidge, Vice-President of the United States, was born at Northampton, Mass., July 4, 1897. Graduated from Amherst College, studied law and became member of the Northampton, Mass., in 1927. After serving in both houses of the Massachusetts legislature, he served three years as lieutenant-governor, and was subsequently nominated and elected Vice-President.

# The Book of THE UNITED STATES

## WHAT THIS STORY TELLS US

**C**HILDREN usually do not think much about government. They know that they live in a republic but they seldom know much about it. Because they think so little about government, our schools are generally organized as absolute monarchies, where the teacher makes all the laws. Below we give you the story of a method which gives the pupils a great deal to say about the government of their school. It is called the School Republic, and tells you what has been done in many states of the Union, and in some foreign countries. The plan allows the pupils to make all the common rules and regulations which are necessary for the orderly conduct of a school. Schools, cities or states cannot exist without government of some sort, and the only question is as to who shall do the governing. This interesting story tells what students have done.

## THE SCHOOL REPUBLIC

**D**ID you ever hear of a School Republic? Probably not, for they are not very common, and you can hardly guess what the words mean, for your own school is probably not organized in that way. You are sure that republic has something to do with people governing themselves, and in few schools do the pupils have that privilege. You probably think that it is the business of the teacher to govern the school.

School republics are schools where the pupils make the rules of conduct, try any one of their number who has broken one of them, and perhaps punish him. Such school republics are organized in several countries of the world, and more and more people are growing interested in them. Let us see why this is true.

### **WHY ARE PEOPLE SO MUCH INTERESTED IN GOVERNMENT?**

Since the Great War began everybody has been talking more about government than ever before. We have learned that the kind of government people have makes a great deal of difference in the way they behave. If they have a government in which they have no part, they cannot prevent their rulers from doing many evil things if they desire to do so, and the rulers can even compel the people themselves

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to take part in doing such things too.

Our soldiers and sailors are fighting in the war "to make the world safe for democracy."

This means, in part, that the people must have the right to govern themselves, and that no one must dare to harm them. Democracy comes from two Greek words which mean the "rule of the people."

Now the people may have a great deal of power, even though they have a king, and they may not have any at all. The people of Canada say that they are a part of the British Empire, over which King George V rules, but the people of Canada rule themselves. On the other hand, the people of some kingdoms do not have anything to say about how they shall be governed. So you see what you call the government of a country does not always tell how much the people have to say about that government. Republics generally allow the people more freedom than kingdoms, but this is not always true.

People often say that a country cannot have a republic, or that the people cannot have power because they do not know how to use it. That is what is the matter with Russia, they say. The people of Russia do not know enough to govern themselves, and that is the reason why there is so much confusion in that unhappy country. Peo-

ple sometimes point out the republics of San Domingo and Haiti, and say the same things about them.

### HOW CAN SELF-GOVERNMENT BE LEARNED?

Perhaps they are right, but we can ask, how are the people of these countries ever going to learn to govern themselves if they have no practice? One cannot learn to play the piano, or to spin a top, even, without practice. We see grown men taking a great deal of time, and making many bad shots, learning to play golf. One might tell you how to play baseball for years, but if you never had a ball in your hands during that time, you would not learn to play the game. You might know a great deal about it, but that is not the same thing, as you would soon find out on the field.

We do not have good government in all our states and cities, even though the people here have the right to govern themselves. One reason is that many of our grown people either do not know much about their government, or else they do not take the trouble to see that good men are elected to office. We cannot have good government unless the citizens take interest in it, and see that the laws are obeyed.

### WHAT GROWN PEOPLE SAY ABOUT CHILDREN

Now grown people often complain of children and say that they do not control themselves. Unfortunately what they say is sometimes true, and children often annoy their elders and do themselves much harm, because they do what they think they would like for the minute, without thinking whether it is the thing which will give them, and those around them, the most happiness in the end. But are the children always to blame?

For one, I am quite sure they are not. Children have very little practice in learning how to govern themselves. They are told to do this, or to do that; they are told not to do this, or not to do that. Sometimes they are told one thing one day and the opposite the next day. They cannot understand the reason, and they sometimes come to think that there is no reason in it. When they disobey or forget, sometimes they are punished, sometimes not. Some parents are foolish enough to punish too little, as well as to punish too much. There is no doubt that wrong-doing should be punished.

### THE FORM OF GOVERNMENT IN THE SCHOOL-ROOM

The same thing is true with teachers, for the school-room is generally an absolute monarchy. An absolute monarchy is, you know, a form of government where the ruler has all the power, and the subjects have nothing to say about the government. If the monarch is very strong there is good order, while if he is weak there is a great deal of trouble. The subjects break the laws, and no one is happy.

Now some wise men thought over the fact that we have a republic here in the United States, and that the boys and girls in the school-rooms will help to rule this country in a few years. They have been getting no training for this responsible work. Is it not just as important that they should learn how to be citizens as it is that they should learn how to spell, or to calculate percentages? A citizen must be a citizen all the time, and he is not always spelling or calculating percentages.

### AN IDEA WHICH CAME TO A MAN

Then an idea came to one of these men while he was thinking over the question. Why not organize the school-rooms as school cities, or school states, or school republics, and allow the pupils to learn how to govern themselves? Many people thought the man who first suggested the idea had lost his wits. They said that there would be so much disorder that the school could not go on, and that no child would learn anything at all. Some people simply laughed at him. They had the idea that children are naturally bad, and like to do wrong.

The man did not mind their laughter, and would not stop talking about his idea. At last he got the managers of some schools to agree to try the plan. They allowed him to tell the children what he had in his mind, and the pupils were eager to join with him when they heard the explanation. A sort of constitution was drawn up, elections were held, the school cities were organized, and set to work. None of the dreadful things that people had feared came to pass. The children took more interest in their schools than ever before, had better lessons, and behaved much better. The teachers had an easier time, and the children were happier in school than they had been under the old plan.

**THE OFFICERS ELECTED IN A SCHOOL CITY**

One of these school cities elected only a mayor, a chief of police, a judge, and a health officer. As the school was small, all sat together to make the laws, which are only rules. They talked over the things which ought, or ought not to be done, and voted on them. If a majority voted for them they were written down, and all understood that they were to obey them. In a republic the majority must rule. If any one disobeyed, the chief of police arrested him and brought him before the judge. Witnesses were called and the judge listened to them. Then he decided upon the punishment.

The laws were the simple laws of good conduct which all the children knew, even if they had broken some of them sometimes. They had laws about order in the halls, about marking on the walls, about behavior on the playground. They made laws about neatness of desks, and about neatness of person, and appointed inspectors to see that they were obeyed. Some school cities make laws about cheating, about lateness, and about telling lies. Some cities have made more rules than the teacher had made, and have obeyed them better too.

If a policeman saw a boy about to break any of the laws, it was his duty to go up to the offender and warn him to stop. Usually this was enough, but sometimes the boy or girl would keep on in spite of the warning. The policeman would then order him to appear before the judge at a certain time and would tell the witnesses to be present. The judge would then ask the policeman what he had seen, and would ask the offender what he had to say for himself. After hearing what the policeman, the witnesses and the offender said, the judge would decide whether or not he was guilty.

**HOW THE JUDGE PUNISHED THOSE WHO HAD DONE WRONG**

Punishments in a school city are of various kinds. Sometimes the judge reprimands the offender before the whole school. No citizen likes that, of course, and often it is enough to make him do better in the future. Sometimes he is shut out of all the games for a certain time. Sometimes he is ordered to apologize in public for his rudeness. If he has destroyed property, he must make good the loss before anything else can be done.

If a boy or girl has done anything very bad, he or she may be deprived of a citizen's rights in the republic. This is one of the most serious punishments. It means, of course, that he no longer has a vote in the affairs of the republic, and can hold no office.

Many school republics were founded after the first ones, and some judges have ordered all the citizens not to speak to some one who had been guilty of a very serious offence and did not seem to be sorry for it. It has been found that this is the most severe punishment that can be inflicted. It is said that no boy has been able to endure being cut off from his fellows for more than one week.

The most interesting thing about the whole matter of punishments is that little punishment has been found to be necessary. When boys and girls feel that they have had a part in making the laws, they also feel that they ought not to break them. Many boys, who had been troublesome to their teachers in many ways, became model citizens after the organization of the school republic. Public sentiment looked upon a law-breaker with disfavor. The citizens felt that one who did not obey was really harming every one of them. This is what every good citizen should feel about breaking the law.

**DIFFERENT FORMS OF GOVERNMENT IN SCHOOL REPUBLICS**

Such a form of government as this, where every one has a direct voice in making the laws, is called a pure democracy. It works very well while the number of citizens is small, but does not work so well where it is very large. In a very large school it is necessary to organize each room as a ward in the city, and to elect one, two, or three aldermen from each. These aldermen meet together to make the laws for the school city. They represent the pupils, and so we call this a representative democracy. There would be one mayor, and one chief of police for the whole school.

Of course, in a large school city there would be need for more than one judge, and for several policemen, health officers, inspectors and the like. They are sometimes appointed, by the mayor, and sometimes elected by the citizens. Their duties would be the same in either case. In large school cities a district attorney might be necessary. This officer always represents the people in court. It is his



business to state the case for the people when any one is accused of doing wrong.

### WHAT POSITION HAS THE TEACHER IN A SCHOOL REPUBLIC?

Some one may inquire if the teacher has anything to do with the government of a school republic. Can he or she have nothing to do with the government of the school? It is always understood that the rights of the teacher are still there. He simply delegates some of them to the pupils. First, he must approve the charter or the constitution under which the school republic works, and sometimes the charter provides that he may veto, that is, forbid, any law, or that a law may not go into effect until he signs it.

Some one made this comparison. The position of the teacher and the school board, or the school trustees, is like that of a state government, while the school republic is like that of a city in the state. A city has a charter giving it some rights of government and the power to do certain things. So long as the city does not abuse these powers, the state government does not interfere. If it does misuse its powers, the state steps in to stop it, and can take the powers away, or change them as it sees fit.

### THE DIFFERENCE BETWEEN A SCHOOL CITY AND A SCHOOL STATE

In a very large school, or in a small city where there are several schools, a school state is often organized. Here each school keeps the officers it has and makes some laws for itself, but elects representatives to the school legislature to talk over the matters of all the schools, and to make laws which apply to all of them. All the schools have some of the same laws, and the conduct in all the schools may be more nearly the same. A school state must have a governor, of course. In a real state he is chosen by all the citizens. If a school state should be organized we could say that the position of the teacher and school board was similar to that of the president and Congress.

Of course girls as well as boys must be citizens of the school city or the school state. They are quite as important in school as the boys are, and should have equal rights. Women are voters in many states now, and before very long they will be voters in all the states, and it is quite as necessary for girls to learn to rule themselves as it is for the boys. In some

school states girls have been elected mayors or judges and have made good officers.

### WHAT BOYS AND GIRLS LEARN FROM THE SCHOOL REPUBLIC

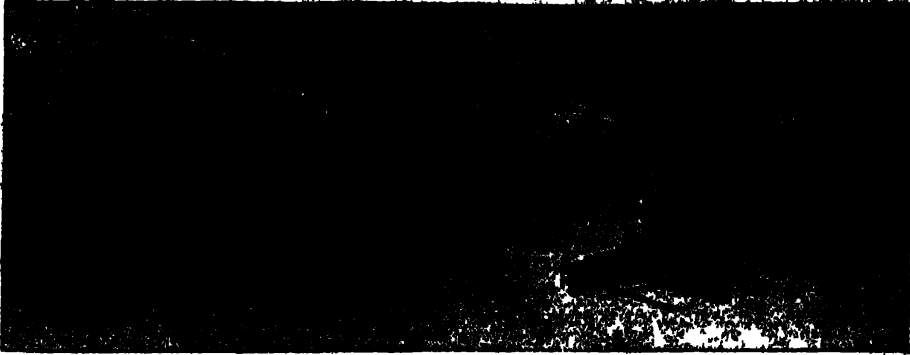
What is the use of all this? In the first place it makes the children happier, and more contented, and that is something. They behave better, they learn how government is carried on, they learn a very important lesson, which is that in a republic the majority must rule; they learn the duties of the different officers in a city or state, and they soon discover whether or not an officer is doing his duty. They learn why laws are made. All of these things are good training for them.

The idea of the school republic has spread to other lands. When General Leonard Wood was governor of Cuba, he appointed Mr. Wilson L. Gill, the author of the school republic idea, to supervise the training for citizenship in the schools of that island. School republics were organized in each of the three thousand, six hundred schools, with excellent results. Though the Republic of Cuba, when it took over its own affairs, did not feel that it could appoint an officer to continue the work, many of the schools in Cuba yet use the plan.

### SOME PLACES WHERE THE PLAN HAS BEEN TRIED

In the United States it is in use in some of the Indian schools with excellent results. The Indian boy or girl has not had even as good an opportunity as the white child to learn the duties of citizenship. Indians have not been allowed to become citizens until recently, and so their parents could teach them little on the question. In far-away Alaska there are school republics both in the white schools, and in those where the little Indians and Eskimos are taught. The idea has found favor in Japan. There are school republics in several countries of South America, in Hawaii, in South Africa, and in some of the European states. In fact it is difficult to find a country where there are not a few. Unfortunately many parents and teachers are afraid to introduce the idea. Parents were brought up under the old system, and many have forgotten that they were ever children; and the teachers fear that the plan will not work, because it is so different from the methods they know.

THE END OF THE BOOK OF KNOWLEDGE.



The Invalid is Interested and Amused.

## THE WONDER OF RADIO

**WE** live in an age of marvels. One wonderful invention follows another, and no one can even guess the limits of the inventive power of man. We take all these inventions as a matter of course and seldom stop to think how different is the world in which we live from the world in which our grandfathers or our great-grandfathers grew up.

We have told you of many of these wonderful inventions. The changes and improvements in methods of communication have been among the greatest of all. We have told you of the locomotive, the steamboat, and the airplane; of the phonograph, the telegraph, and the telephone. Now we come to radio, the latest of the wonders. If you will read the stories of the telegraph and the telephone first you will understand radio better.

To make slender wires carry signals or speech seemed a miracle. When it was found that these same signals could be carried without wires, as told in Volume XI, the whole world gasped. Scientists were sure that some day speech and other sounds would also be carried, but the spark-gap, about which you will read in the story of the telegraph, did not carry speech very well. Much study and many experiments were necessary before delicate

instruments were constructed which would carry clearly and surely the sounds uttered many miles away, and give them back without change. Great progress was made during the World War, but it was not until about 1920 that the radio-telephone became a popular success.

Now its use is almost world-wide. One of our readers may be in a lonely farmhouse among the hills, another in a city apartment, and a third, perhaps, in a lighthouse on an island. The only sounds they hear are the wind in the tree-tops, the dull roar of traffic, or the beat of the waves. With the turn of a knob each may hear the same things. Perhaps the voice of a famous singer is being heard by thousands instead of hundreds; perhaps a great orchestra is playing some masterpiece; perhaps a teller of stories is amusing the little folks; perhaps the scores of baseball games are being given inning by inning, sometimes play by play; perhaps the weather man is telling of an approaching storm, or market reports are being sent out to the farmers. In fact these broadcasting stations have something for every member of the family. We shall tell you more of them in a moment.

### RADIO WAVES AND SOUND WAVES IN THE ATMOSPHERE

Now let us see how it is done. What

does radio mean? You are told elsewhere in our book that sound waves travel through the air at the rate of a mile in about five seconds, though they travel faster through metal. It has been found that electro-magnetic waves can be set up in the atmosphere. They travel at the speed of light; that is, 186,000 miles a second, several hundred thousand times as rapidly as sound waves. The waves pass not only through the atmosphere but also through walls, forests and mountains. Some are absorbed, but enough get through to affect the sensitive receiver, but they cannot be felt by any of our five senses. That is, our unaided senses cannot tell whether the air is empty or full of these waves. The waves travel in all directions from the center from which they begin. Have you ever thrown a pebble into a pond and watched the circles of waves move out to the banks, growing weaker as the distance increases? Radio waves in the atmosphere move in a similar way, except that they move outward in every direction. Perhaps you can understand the way they spread better if you think of a soap-bubble growing larger and larger. Now think of a succession of smaller bubbles, each inside the next larger one and each growing larger and larger; or think of the way the rays of light from a candle spread in every direction. Remember these illustrations, for you will need them again.

#### WHAT DO WE MEAN BY WAVE LENGTH?

These radio waves are produced by the vibration or oscillation of electric current. There is more than one kind of electric current. A direct current flows steadily in one direction, but direct current does not produce radio waves. An alternating current flows in one direction until it reaches its height, flows back, rises again, flows back, and so on with marvelous rapidity. Each complete change is called a cycle. Ordinary lighting current in an electric lamp goes through about sixty cycles in a second. The rate of radio vibration is much higher—from 20,000 to as much as 6,000,000 cycles every second. This is called radio frequency.

You have been told that radio waves travel 186,000 miles in a second. Then it is plain that the length of a wave, by which we mean the distance from the top of one to the top of the next, will be the distance that the current travels in a

second divided by the number of vibrations in the same time. Now 186,000 miles is about 300,000,000 metres. This sum divided by 1,000,000, say, gives a wave length of 300 metres. By regulating the number of cycles, different wave lengths may be obtained. In order to hear clearly, the receiving end must be tuned to the same wave length sent out by the transmitter.

#### THE FOUR REQUIREMENTS OF RADIO

Now, how are these waves set in motion, and how are they received? These four things are required: (a) a transmitter which will change the sound waves produced by the voice or musical instrument into electro-magnetic or radio waves; (b) an antenna or aerial which will set them loose in the atmosphere; (c) a receiving antenna which will respond to the waves sent out by another antenna perhaps hundreds of miles away; (d) a receiver which will transform these radio waves back into sound waves.

It would take a whole book to describe the different kinds of instruments which may be used for sending and receiving. In fact there are dozens of books which tell how to set up and use radio sets, and the boy or girl who wishes to set up a set, or even to make one, would do well to get one of these books. Our space will not allow us to go into all the details.

There are many kinds of transmitters, but the principle is the same in all. There must be a source of electric current. This current must be changed into a high or radio frequency current. A mouthpiece which responds to sound waves must be connected with the current, so that the sound waves may be transformed into radio waves. A wire must lead to the antenna which flings the waves into the atmosphere. This antenna is a wire or wires stretched between two points some distance above the ground. The more expensive sets can be adjusted to give radio waves of several lengths. The cheaper sets cannot.

#### WHAT THE SIMPLEST RECEIVING SET REQUIRES

Most of our readers are more interested in receiving than in sending, and the difference between receiving sets is greater than in the sending sets. The very simplest receiving set has an antenna with a wire leading down to the receiving room, another wire to the ground, a detector

## SPEECH AND MUSIC ARE SEEN AND HEARD



Dean Fay of Tufts College is here shown reading the first of a series of lectures into a sensitive microphone. This lecture was heard by thousands, some of them many miles away.



Miss Jean Wood of Toronto, Canada, is playing a piano selection. Though the audience is not visible, it is much larger than could be packed into any hall, however large.



Mario Chamlee, Orville Harrold, tenors, and Madame Lucresia Bori, soprano, all of the Metropolitan Opera Company, are having tea in Madame Bori's apartment, in New York City. Incidentally they are listening to a concert given, perhaps, by some of their colleagues, which is coming through the air from the broadcasting station at Newark, N. J., miles away. Pictures from Underwood & Underwood, N. Y., and copyright.

which transforms the high frequency radio waves into currents which travel in one direction only, and a telephone receiver which makes waves audible. The simplest detector is a mineral crystal, which, by allowing the waves to pass through in one direction much better than in another, changes (rectifies) the alternating current into a direct current. The most popular crystal is galena (lead sulphide).

Such a set requires no battery and costs very little, but it is not very satisfactory. Generally it will catch messages from stations near by, but it cannot be tuned to receive only waves of a given length. Therefore, if two or more stations are transmitting, there is likely to be confusion, just as there is when you try to listen to two people talking at the same time. A tuning coil or a variometer may be added, and then one can select the length of wave one wishes to hear.

It is possible to make these sets very small. One man has made a set which is fastened to a ring which he wears on his finger. There are pocket sets in which the tiny detector is fastened on the back of a small telephone receiver. Two tiny spools of wire are attached. One wire can be attached to a large umbrella or to a fire escape, or even to an iron bed, which is made to serve as a receiving antenna, and the wire from the other spool is attached to a water pipe or an iron fence which serves as a ground. With such a set one can pick up waves sent by a powerful station near by.

In fact in a receiving set an antenna set high in the air is not absolutely necessary. Since the radio waves pass through walls and fill the atmosphere everywhere, a loop antenna set up inside the house is sometimes used. This loop is a wooden frame around which is wound a number of turns of wire, spaced about an inch apart. One man, whose landlord would not allow him to set up an antenna on the roof, dropped a wire down the chimney. The radio waves passed through the bricks, and he was able to hear sending stations near by. Another man ran a wire around the room behind the picture molding. There are receiving sets no longer than a policeman's club which can be carried anywhere. Of course none of these sets is so sensitive as one with a high antenna. In cities, however, the loop antenna is being used very frequently.

#### THE LITTLE INVENTION WHICH MAKES THE WIRELESS TELEPHONE POSSIBLE

The better sets use a vacuum tube instead of a crystal detector. In fact this little vacuum tube is what makes radio, as we have it to-day, possible. The vacuum tube is a glass tube, much like an electric lamp. Within is a tungsten filament (around which is a coil of wire called a grid), and a plate. The vacuum tube has three important uses. In the transmitter it will convert direct current from a storage battery into the high frequency alternating current which will produce the radio waves and does away with the spark-gap; in the receiver it will take the place of a crystal detector and change radio waves into direct currents, and it can also be used to make the sounds stronger. By using enough vacuum tubes one can increase or amplify the sound of a voice so that it can be heard for miles. With vacuum tube sets electric batteries are necessary.

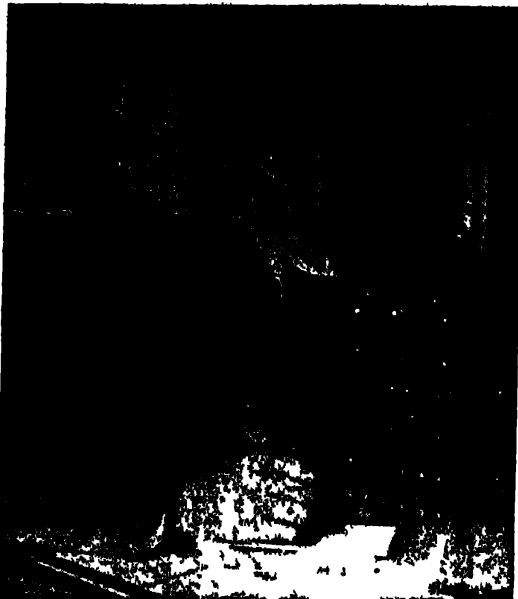
#### THE MEN WHO INVENTED RADIO

No one man can be said to be the inventor of the radio-telephone. The principles are the same as those of the radio-telegraph, though of course it is harder to transmit speech or music than signals. Only a few of the experimenters can be mentioned. Professor R. A. Fessenden made an experimental radio-telephone as early as 1900. Improvements were made by E. W. F. Alexanderson, and again by Valdemar Poulsen. Dr. Lee de Forest, who had already done much for radio-telegraphy, discovered some of the properties of the vacuum tube. The work of Dr. Irving Langmuir and Major E. H. Armstrong is important. There are dozens of others, perhaps equally important.

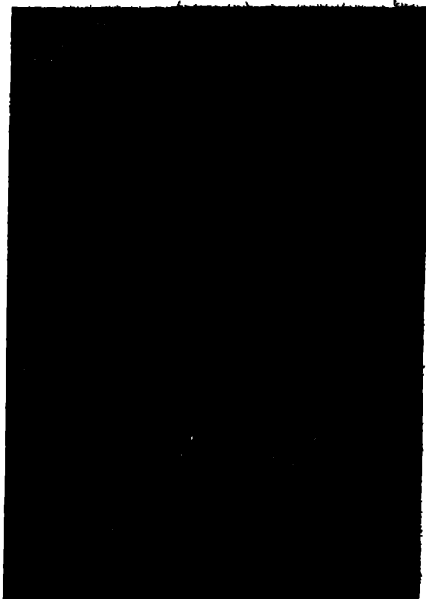
#### WHAT ARE BROADCASTING STATIONS?

The great companies which make electrical apparatus worked long and hard to improve and simplify the instruments for radio-telephony. When they succeeded they set up great stations with powerful transmitters in different parts of the country. Each station always uses the same wave length, which is different from that used by other stations, and flings the waves into the air in every direction. Daily programmes are made up and advertised. At every hour of the day there is something of interest for some member of the family; or, if one has a good re-

## SOME INTERESTING USES OF RADIO



General Pershing is here shown listening to a message out of the air and is making a memorandum. The use of radio in any future military and naval operations will be exceedingly important and helpful.



Here is a portable field set which can be carried anywhere. Notice the antenna fastened to the tree, and the wires coming down to the instruments on the ground. Picture from Brown Bros.



These two sets are in the naval radio station at Arlington. The smaller one on the left is the set which keeps in constant communication with President Harding when he is on the Mayflower, the boat assigned to the President's use. The larger set is used for scout purposes and has a longer range. Notice that it uses loop antennas, turned in different directions. 1st and 3d pictures copyright by Underwood & Underwood, N Y

ceiving set, one can select from two or even three programmes given many miles apart. A family in a little village in the woods can keep in touch with the world.

These broadcasting stations are maintained by the manufacturers at great expense, in order to increase the demand for instruments. Any one can listen in who can tune his receiver to the proper wave length. How long the manufacturers will find it profitable to pay singers, orchestras, lecturers and story-tellers, no one can say. Some one will continue to maintain them, however. Perhaps a small fee will be charged every purchaser of instruments; perhaps the government will collect a tax from every owner for the purpose of keeping up the stations; perhaps the government will keep them up just as it maintains schools. The plan is too valuable to be given up.

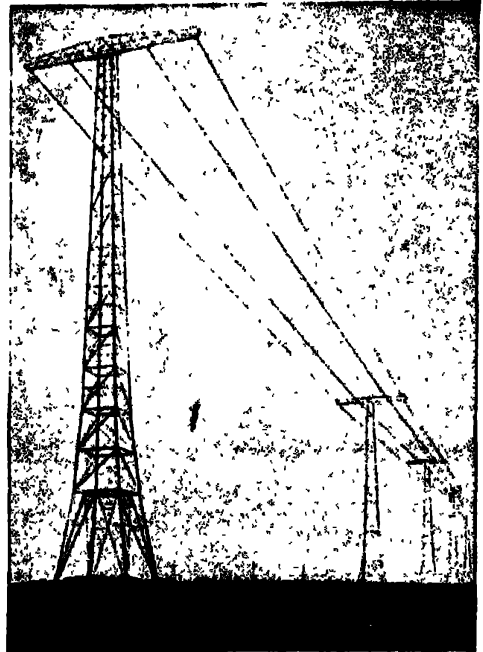
It is perfectly possible to arrange any auditorium, concert hall, or opera house, so that the lecture or the music can be sent out into the air to be gathered by listeners for hundreds of miles around, but there is no way of collecting pay for the service. The management objects to sending free, because many people would listen at home instead of paying admission to the performance.

#### WILL RADIO TAKE THE PLACE OF WIRES ALTOGETHER?

It is not likely that radio will soon take the place of wires entirely, for several reasons. In a great city there are many thousand telephone subscribers. It would be impossible to assign a different wave length to each individual, and when two stations are sending out the same wave length there is confusion. In addition, there is as yet no such thing as privacy in radio. Any message sent out can be caught by any receiver which can be tuned to the proper wave length, and so the most private conversation can be heard by all. It seems that for short distances we shall continue to telephone by means of wires.

On the other hand radio will be a great addition to wire systems. It is perfectly possible for a subscriber to call up his central by wire, ask to be connected with the radio station, which will call some one on a ship far out at sea to the radio room on the ship, and the two can then talk with ease. In fact something like this is done regularly. Santa Catalina Island is a popular summer resort over thirty miles from the California mainland. There is a

radio station at Pebbly Beach on the island, and another on the mainland at Long Beach, twenty-five miles from Los Angeles. Any subscriber in Los Angeles can talk with any subscriber on the island. The message goes in this way: from the subscriber to central (by wire); to Long Beach (by wire); to Pebbly Beach (by radio); to an island central (by wire); to the individual subscriber (by wire). In fact subscribers in San Francisco often talk to friends on the island by way of Los Angeles, thus adding two more links to the chain.

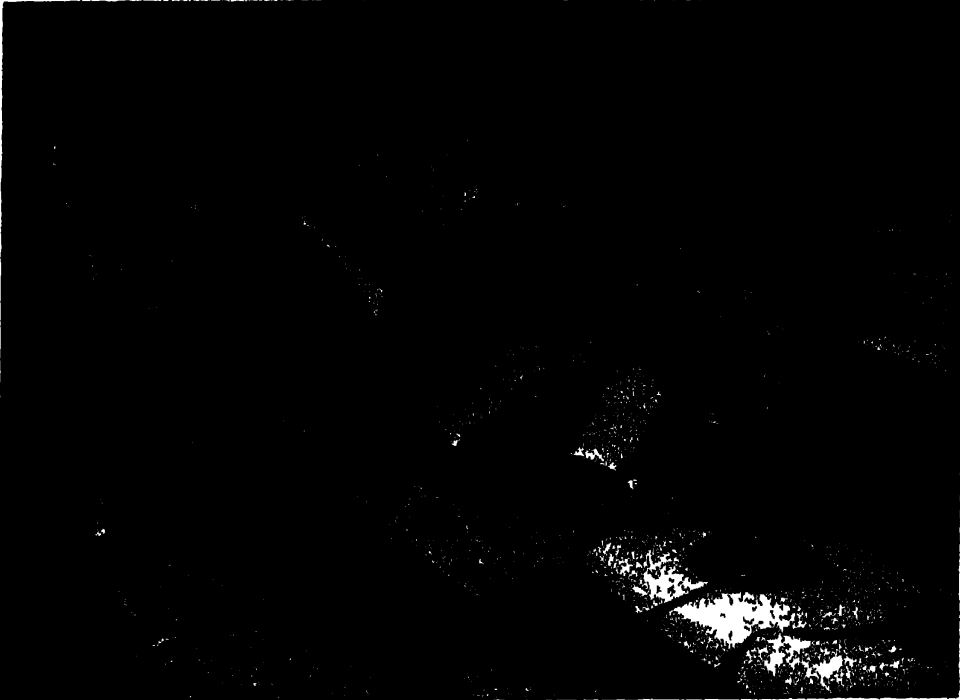


This is a small part of the aerial wires at the new radio station at Port Jefferson. Each of the steel towers is more than four hundred feet high. This station will communicate with Europe, South America and the Pacific Islands.

Picture from Underwood and Underwood, N. Y.

For long-distance work radio will become very important. It is expensive to set up and maintain a thousand miles of wire on poles. Powerful radio stations will cost much less, and will serve the purpose quite as well, if not better, for wires are constantly breaking on long lines. Explorers in the future will carry radio sets, and many lives will be saved as a result. It is probable that men will soon talk regularly across the ocean. Already the United States Government station at Arlington has talked with Honolulu, Hawaii, and it is likely that such communication will become common.

## A TRAIN SET AND A BROADCASTING STATION



Elsewhere we have shown the process of telegraphing by radio from a moving train. The Delaware and Lackawanna Railroad has now equipped some of its trains with radio-telephone sets, so that messages can be sent and received from the train while in motion. Undoubtedly the ability to communicate with a train which has passed a signal will prevent many accidents.

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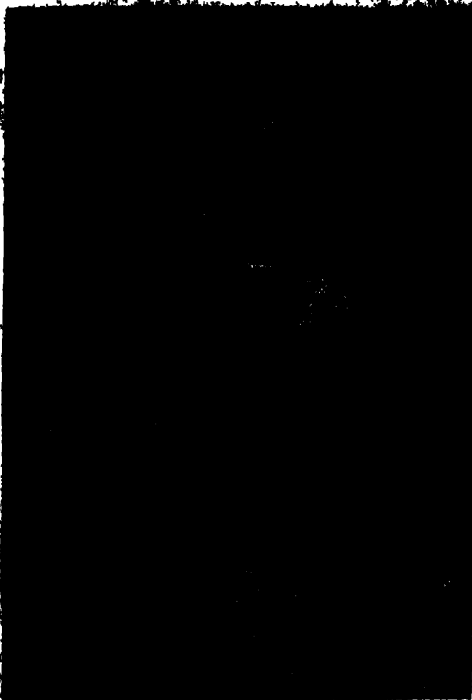


This is the interior of the broadcasting station at Schenectady, N. Y., at the time the picture was made the most powerful in America. The array of wires, tubes, batteries and switches is bewildering. Recently at a hotel in Santa Clara, Cuba, the guests cabled that they were dancing to the music sent out by this station nearly 1,500 miles away.

Picture from Underwood and Underwood, N. Y.



## BOYS SHOW THEIR INTEREST IN RADIO



This youngster of five years is interested and has learned to tune the set so that the sounds are clear. He uses the amplifier or loud-speaker which can be used with this set.



A schoolboy of Plainfield, N. J., only twelve years old, has made a receiver which will fit into an ordinary safety match box. He and his brother, both Boy Scouts, are listening to a concert.



This fortunate youth can always receive and interpret any of his friends who come to visit him. By using the headphones instead of the loud-speaker they do not disturb other members of the household. Some of the best work in radio is being done by youthful amateurs, and the results will doubtless show in many improvements as they grow older. Upper pictures copyright by Underwood & Underwood, N. Y.; lower from Brown Bros.

# GENERAL INDEX TO THE BOOK OF KNOWLEDGE

For titles of poems or first lines see Special Poetry Index following the General Index. Authors' names are in both the indexes.

THIS Index, containing about twenty-five thousand entries, will enable you to find very quickly everything contained in *The Book of Knowledge*. It is not arranged exactly like an ordinary index, for *The Book of Knowledge* is not like any other book in the world. The book does not contain all the accumulated knowledge of the ages, but those things which it is most important to know, arranged so that they can be quickly and easily understood. Like an ordinary index, it is arranged alphabetically.

Many subjects are indexed twice or even three times. For example, you wish to know something about the Sun: look for the word and you will find dozens of references to the Sun and its work. Under the word *Earth* you will easily find the story of the Sun and the Earth together. You will find Hockey in its place under the letter *H* and also under *Games*. You will have little trouble if you think for a second before you look.

The Special Poetry Index will prove a great help. The names of the authors are in the General Index under their proper letters. They are also found in the Special Index and under each name are the titles of the poems by that author. Suppose you do not know an author's name: the titles of the poems are given in their proper place according to the first important word, and the first lines according to the first letter of the first word.

The book contains nearly ten thousand pictures, and, of course, only the most important could be indexed separately, but you will have little trouble in finding what you want. Almost every article is illustrated, and if you look in the index for the most important word in the subject you are likely to find pictures on or near the pages to which you are directed.

Think of what you want and look under the most important word. If you want a person, look under his name; if you want a country, look under its name. Everything is indexed under the word you are most likely to think of. For Poetry, see the Special Poetry Index.

The black-face figures give the volume number, and the light-face figures give the page number.

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